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Commercial Fisheries Management
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Age, Sex, and Size Composition of Pacific Herring from Coastal Spawning Sites in the Arctic-Yukon-Kuskokwim Region, 1991

by

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and

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State of Alaska

Walter J. Hickel, Governor

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TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES	iv
LIST OF FIGURES	v
LIST OF APPENDICES	vi
ABSTRACT	ix
INTRODUCTION	1
METHODS	1
Sampling Techniques	1
Biomass Estimation	2
RESULTS AND DISCUSSION	2
LITERATURE CITED	5
TABLES	7
FIGURES	9
APPENDIX	20

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1. Age composition of Pacific herring for the run, harvest, and escapement biomass for districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991		7
2. Age composition of Pacific herring spawning populations expressed in percent age by number for districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991		8

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1.	Commercial herring fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991	9
2.	Commercial herring fishing districts and subdistricts of Norton Sound and Cape Romanzof, Arctic-Yukon-Kuskokwim Region, Alaska, 1991	10
3.	Spawning time comparison of Pacific herring grouped by ages 2 to 5 and age 6 and older for districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991	11
4.	Pacific herring run biomass distribution by commercial fishing district, Arctic-Yukon-Kuskokwim Region, Alaska, 199	12
5.	Age composition of Pacific herring for the run and harvest for the Security Cove, Goodnews Bay, Cape Avinof, and Nelson Island Districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991	13
6.	Age composition of Pacific herring for the run and harvest for the Nunivak Island, Cape Romanzof, and Norton Sound Districts, and the Arctic-Yukon-Kuskokwim Region combined, Alaska, 1991	14
7.	Age composition of Pacific herring spawning populations for commercial fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991	15
8.	Pacific herring recruits (ages 3, 4, and 5) for commercial fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991	16
9.	Mean standard length of sampled Pacific herring by age class and commercial fishing district, Arctic-Yukon-Kuskokwim Region, Alaska, 1991	17

LIST OF APPENDICES

<u>Appendix</u>	<u>Page</u>
A. Sample size for age composition samples	20
B.1. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Security Cove District, 1991	22
B.2. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Goodnews Bay District, 1991	23
B.3. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Cape Avinof District, 1991	24
B.4. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Nunivak Island District, 1991	26
B.5. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Kokechik Bay area, Cape Romanzof District, 1991	27
B.6. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Unalakleet Subdistrict, Norton Sound District, 1991	29
B.7. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Cape Denbigh Subdistrict, Norton Sound District, 1991	30
B.8. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Unalakleet/Cape Denbigh Subdistricts combined, Norton Sound District, 1991	31
B.9. Age, sex, and size composition of herring sampled from the commercial beach seine harvest, Unalakleet Subdistrict, Norton Sound District, 1991	32
B.10. Age, sex, and size composition of herring sampled from the commercial beach seine harvest, Cape Denbigh Subdistrict, Norton Sound District, 1991	33
B.11. Age, sex, and size composition of herring sampled from the commercial beach seine harvest, Unalakleet/Cape Denbigh Subdistricts combined, Norton Sound District, 1991	34
B.12. Age, sex, and size composition of herring sampled from the subsistence gillnet harvest, Nelson Island District, 1991	35

LIST OF APPENDICES (Continued)

<u>Appendix</u>	<u>Page</u>
B.13. Age, sex, and size composition of herring sampled from the educational gillnet catch, Unalakleet Subdistrict, Norton Sound District, 1991	36
B.14. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Security Cove District, 1991	37
B.15. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches, Goodnews Bay District, 1991	39
B.16. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Jacksmith Bay area, 1991	41
B.17. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Cape Avinof District, 1991	42
B.18. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Kwigillingok area, Cape Avinof District, 1991	44
B.19. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Nelson Island District, 1991	46
B.20. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Nunivak Island District, 1991	49
B.21. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Kokechik Bay area, Cape Romanzof District, 1991	51
B.22. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Scammon Bay area, Cape Romanzof District, 1991	53
B.23. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Kokechik Bay\Scammon Bay areas combined, Cape Romanzof District, 1991	54
B.24. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, St. Michael Subdistrict, Norton Sound District, 1991	56

LIST OF APPENDICES (Continued)

<u>Appendix</u>	<u>Page</u>
B.25. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Unalakleet Subdistrict, Norton Sound District, 1991	58
B.26. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Cape Denbigh Subdistrict, Norton Sound District, 1991	60
B.27. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Norton Bay\Elim Subdistricts combined, Norton Sound District, 1991	62
B.28. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Norton Sound District combined, 1991	63

ABSTRACT

During their 1991 spring spawning migration, Pacific herring *Clupea pallasi* were sampled from seven of the eight commercial fishing districts within the Arctic-Yukon-Kuskokwim area of the Bering Sea. Between 6 May and 23 June, 14,120 herring were sampled for age, sex, and size information. Samples were collected using variable-mesh gillnets operated by Alaska Department of Fish and Game personnel and from commercial beach seine and gillnet harvests. Overall, age-9 herring dominated the 1991 spawning population and composed an estimated 24.3% of the run biomass and 22.2% of the population in numbers of fish. Herring recruit ages 3, 4, and 5 accounted for an estimated 8.8% of the run biomass and 17.2% by number. In the Security Cove, Goodnews Bay, and Cape Avinof Districts, recruits composed 31.9% of the spawning population in numbers of fish. Substantial recruitment of herring to the spawning biomass last occurred in 1982 and 1983 because of strong 1977 and 1978 year classes. In 1991 the run biomass was 64,541 tons and the commercial harvest was 7,550 tons, for an overall exploitation rate of 11.7%. The mean length within each age class progressively decreased northward from Security Cove to Norton Sound. In most samples, male-to-female ratios showed a slight preponderance of males.

KEY WORDS: Pacific herring, *Clupea pallasi*, Bering Sea, age, sex, size, biomass, population

INTRODUCTION

The purpose of this project was to estimate the age, sex, and size composition of the spawning biomass of Pacific herring *Clupea pallasi* in the Arctic-Yukon-Kuskokwim (AYK) Region of the Bering Sea. Similar studies have been conducted annually by the Alaska Department of Fish and Game (ADF&G) since 1976 (McBride et al. 1981; McBride and Whitmore 1981; Fried et al. 1982a, 1982b, 1983a, 1983b, 1984; Lebida et al. 1985a, 1986; Lebida 1986; Lebida and Sandone 1987; Kerkvliet and Hamner 1988, 1989, 1990). Development of annual fishery management plans for Bering Sea herring stocks rely on these data.

The coastal waters of Alaska from Cape Newenham to Cape Prince of Wales composed the study area (Figures 1, 2). The eight regulatory commercial fishing districts located within the study area are Security Cove, Goodnews Bay, Cape Avinof, Nelson Island, Nuniavik Island, Cape Romanzof, Norton Sound, and Port Clarence. Norton Sound is further subdivided into seven subdistricts. These subdistricts are specifically identified and described in ADF&G (1991). The commercial harvest in the AYK Region was taken by gillnet, except in Norton Sound where a small portion of the harvest was taken by beach seine.

METHODS

Sampling Techniques

Samples were taken from the following commercial fishing districts: Security Cove, Goodnews Bay, Cape Avinof, Nelson Island, Cape Romanzof, and Norton Sound (St. Michael, Unalakleet, Cape Denbigh, Norton Bay, and Elim Subdistricts). No age composition data for the Port Clarence District was collected because there has been no commercial fishery or test netting there since 1988.

Gear type was categorized as either non-selective or selective for a discrete group of age classes. Non-selective gear was assumed to sample all age classes in the population in proportion to their abundance. Variable-mesh gillnet and beach seine composed the non-selective category; standard-mesh gillnet composed the selective category. Variable-mesh gillnet sets were conducted by ADF&G personnel. Commercial beach seine and gillnet sets were made by commercial fishermen. Age, size, sex, and gonad maturity data was collected from herring catches taken by each gear type.

Data collection methods were similar to those described by Barton and Steinhoff (1980). Sample size goals were established by Conrad (Appendix A) and were based on the methods of Thompson (1987). Sampled fish were measured to the nearest millimeter from tip of snout to hypural plate, weighed to the nearest gram, and aged by counting scale annuli viewed with a microfiche reader. We attempted to sample at least 420 herring from each commercial gear type and fishing period in all districts and subdistricts (Norton Sound). If fishing periods were separated by less than 24 h, adjacent fishing periods were combined into one sample period. Fish were collected from a minimum of 10 boats in the gillnet fishery and at least 2 boats in the beach seine fishery. Sampling coverage of the commercial and subsistence harvest was promoted by collecting herring samples from individual boats of a given gear type

and size. Sixty fish per day was the sampling goal for test net catches. Test sets were preferably of short duration to avoid saturating any mesh size with fish. An effort was made each day to sample fish from as many schools as feasible to promote sampling coverage of the run.

Biomass Estimation

The estimated herring run biomass, spawning time, and spawn distribution was determined by aerial surveys flown throughout the season in each district. Aerial survey procedures followed those outlined by Lebida and Whitmore (1985). In districts where survey conditions were poor preseason projections were used to estimate the run biomass.

The method used to estimate the age class composition of the mature herring run and escapement biomass differed between districts. For Security Cove, Goodnews Bay, Cape Avinof and Nunivak Island Districts, the age composition of the mature herring run biomass was estimated from variable-mesh gillnet catches. Age composition of the escapement biomass was calculated by subtracting the harvests from the run biomass for each age class. For Cape Romanzof and Norton Sound Districts, age composition of the mature herring run was estimated by combining harvests with escapement biomass for each age class. Age composition of the escapement biomass was estimated from the age composition of the variable-mesh gillnets. In all districts, the numbers of fish was estimated by dividing the total tonnage of a given age class by the average fish weight in that class.

RESULTS AND DISCUSSION

ADF&G personnel examined 14,120 Pacific herring between 6 May and 23 June. The age, sex, and size composition of herring sampled during this time are summarized in Appendices B.1-B.28. The data based on variable-mesh gillnet catches suggests (nonstatistical comparisons = NSC) that older-aged, i.e., age 6 and older, herring arrived and spawned earlier in the season than younger-aged, age 5 and younger, herring (Figure 3). This temporal spawning segregation has been observed in previous years ages between ages ≤ 4 and ≥ 5 herring (McBride et al. 1981; Fried et al. 1982a, 1982b, 1983b, 1984; Kerkvliet and Hamner 1988, 1989, 1990).

In 1991 the estimated AYK herring biomass was 64,541 tons for the surveyed portion of the commercial fishing districts. The commercial harvest was 7,550 tons, for an overall exploitation rate of 11.7% (Table 1). The estimated run biomass was distributed among the districts as follows: 6.9% in Security Cove, 6.8% in Goodnews Bay, 3.2% in Cape Avinof, 3.7% in Nelson Island, 6.0% in Nunivak Island, 7.0% in Cape Romanzof, and 66.4% in Norton Sound (Figure 4).

For the region, age 9 was the dominant age class making up 24.3% of the run biomass and 22.2% of the population by number (Tables 1, 2; Figures 5, 6, 7). Age-9 and older herring accounted for 61.8% of the

run biomass and 50.6% of the population by number. Recruits, ages 3, 4, and 5, represented 8.8% of the run biomass and 17.2% of the population by number. Substantial herring recruitment to the eastern Bering Sea last occurred in 1982 and 1983 and was associated with the 1977 and 1978 year classes. In 1991 these herring were 13 and 14 years old. Grouped with age-13 and older fish, these herring accounted for 5.1% of the run biomass and 2.7% of the population by number. The decline of these year classes, due to high natural mortality of older-aged herring, marks a decline in the total harvestable surplus of herring in the region. Age-9 and -10 herring represented 47.6% of the AYK commercial harvest.

At Security Cove the predominant age in the run biomass was age 8 (18.9%), but was age 4 by number (31.7% ; Tables 1, 2; Figures 5, 6, 7). In this district, 43.5% of the run biomass and 29.7% of the population by number was represented by age-9 and older herring. Recruits represented 19.4% of the run biomass and 35.4% of the herring population by number (Figure 8). Age-8 herring made up 23.3% of the commercial harvest.

In the Goodnews Bay District age-7 herring dominated the biomass (18.6%), but age 4 at 22.2% and age-7 at 20.1% dominated the run in numbers of fish (Tables 1, 2; Figures 5, 6, 7). Age-9 and older fish accounted for 51.0% of Goodnews Bay run biomass and 35.8% of the population by number. Recruits composed 13.7% of the run biomass and 27.4% of the population by number (Figure 8). Age-8 herring represented 21.4% of the commercial harvest.

Age-7 herring dominated the Cape Avinof run biomass (18.2%) and numbers of fish (19.3% ; Tables 1, 2; Figures 5, 6, 7). Age-9 and older fish accounted for 46.5% of the run biomass and 32.6% of the population by number. Recruits represented 15.7% of the biomass and 28.7% of the population by number (Figure 8). Age-8 herring composed 19.8% of the commercial harvest in this district.

In the Nelson Island District ages 7 and 8 were the predominant age classes (Tables 1, 2; Figures 5, 6, 7). These age classes combined composed 34.4% of the run biomass and 36.6% of the population by number. Age-9 and older fish represented 54.6% of the run biomass and 40.8% of the population by number. Recruits represented 8.4% of the run biomass and 19.5% of the population by number (Figure 8).

Age 12 was the strongest age class that returned to the Nunivak Island District (Tables 1, 2; Figures 5, 6, 7). This age class accounted for 22.4% of the biomass and 19.0% of the population by number. Age-9 and older herring composed 78.1% of the run biomass and 68.2% of the population by number. Recruitment in the run biomass was 4.5% and was 11.1% in the population by number (Figure 8).

At Cape Romanzof age 7 was the dominant age class in both run biomass (25.0%) and numbers of fish (29.3% ; Tables 1, 2; Figures 5, 6, 7). Age-9 and older herring accounted for 55.9% of the run biomass and 47.5% of the population by number. Recruits composed 3.2% of the run biomass and 6.2% of the population by number (Figure 8). Age-7 herring composed 23.9% of the Cape Rand was 11.1% in the population by number (Figure 8).

Age 9 was the strongest age class in the Norton Sound District both in run biomass (31.8%) and population by number (28.9% ; Tables 1, 2; Figures 5, 6, 7). Age-9 and older fish represented 65.1% of the run biomass and 55.8% of the population by number, and recruits were 7.9% and 14.7% , respectively (Figure 8). Ages 9 and 10 combined made up 53.8% of the harvest.

Throughout the region, mean length by district within age classes generally decreased (NSC) in a southern to northern direction (Figure 9). This trend parallels those noted in previous years (Lebida et al. 1985a, 1986; Lebida and Sandone, 1987; Kerkvliet and Hamner 1988, 1989, 1990). In Norton Sound, commercial gillnets harvested larger herring within an age class than did beach seines.

Overall, percentages of males and females remained fairly equal, males slightly outnumbering females. The male:female ratios for non-selective gear were as follows: Security Cove = 1.2:1, Goodnews Bay = 1.1:1, Cape Avinof = 0.8:1, Nelson Island = 1.2:1, Nunivak Island = 1.6:1, Cape Romanzof = 1.1:1, Norton Sound 1.3:1, overall non-selective gear types = 1.2:1 and the combined harvest = 1.1:1.

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Table 1. Age composition of Pacific herring for run, harvest, and escapement biomass for districts within the Arctic-Yukon Kuskokwim Region, Alaska, 1991.

	Security Cove		Goodnews Bay		Cape Avinof		Nelson Island		Nunivak Island		Cape Romanzof		Norton Sound		Arctic-Yukon-Kuskokwim	
Age	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons
<u>Run</u>																
3	0.1	5	0.5	22	0.8	17	0.5	13	0.0	0	0.0	1	0.3	145	0.3	203
4	17.2	761	10.8	474	8.0	167	5.6	134	3.8	147	1.2	53	0.7	280	3.1	2,016
5	2.1	91	2.4	104	6.9	143	2.3	56	0.7	26	2.0	88	6.9	2,964	5.4	3,472
6	2.3	100	2.7	120	4.0	83	2.4	58	0.5	20	2.1	93	2.7	1,178	2.6	1,652
7	16.0	708	18.6	815	18.2	378	18.1	432	5.6	219	25.0	1,125	9.3	3,972	11.9	7,649
8	18.9	837	14.1	618	15.7	326	16.3	389	11.4	444	13.9	625	15.0	6,437	15.0	9,676
9	6.9	308	6.2	272	11.9	247	6.2	149	8.6	335	16.3	733	31.8	13,636	24.3	15,680
10	13.1	582	11.6	508	9.4	195	11.9	283	16.2	631	15.3	688	15.7	6,721	14.9	9,608
11	9.9	437	11.0	481	10.4	216	10.2	244	13.5	527	9.1	410	8.5	3,621	9.2	5,936
12	9.0	399	13.9	609	8.9	186	14.1	336	22.4	873	8.4	377	6.1	2,605	8.3	5,385
13+	4.6	206	8.3	364	5.9	123	12.2	291	17.4	680	6.8	307	3.0	1,293	5.1	3,264
Total	100	4,434	100	4,387	100	2,081	100	2,385	100	3,902	100	4,500	100	42,852	100	64,541
<u>Harvest</u>																
3	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
4	0.0	0	0.0	0	0.0	0	22.9	16	0.0	0	0.0	0	0.0	0	0.2	16
5	0.0	0	0.0	0	0.0	0	10.0	7	0.0	0	0.2	1	0.1	3	0.1	11
6	0.4	2	0.8	2	0.7	2	8.6	6	0.0	0	0.8	4	0.5	28	0.6	44
7	11.1	63	17.6	46	16.4	44	31.4	22	1.7	1	23.9	126	6.7	387	9.1	689
8	23.3	133	21.4	56	19.8	53	5.7	4	10.3	6	16.1	85	8.3	481	10.8	818
9	10.5	60	9.5	25	14.2	38	7.1	5	6.9	4	15.6	82	34.1	1,975	29.0	2,189
10	16.3	93	11.5	30	16.0	43	7.1	5	17.2	10	14.6	77	19.7	1,144	18.6	1,402
11	11.8	67	9.5	25	10.8	29	2.9	2	22.4	13	10.6	56	14.6	846	13.7	1,038
12	15.8	90	17.2	45	13.8	37	1.4	1	29.3	17	10.6	56	10.9	629	11.6	875
13+	10.9	62	12.6	33	8.2	22	2.9	2	12.1	7	7.6	40	5.2	302	6.2	468
Total	100	570	100	262	100	268	100	70	100	58	100	527	100	5,795	100	7,550
<u>Escapement</u>																
3	0.1	5	0.5	22	0.9	17	0.6	13	0.0	0	0.0	1	0.4	145	0.4	203
4	19.7	761	11.5	474	9.2	167	5.1	118	3.8	147	1.3	53	0.8	280	3.5	2,000
5	2.4	91	2.5	104	7.9	143	2.1	49	0.7	26	2.2	88	8.0	2,961	6.1	3,462
6	2.5	98	2.9	119	4.5	81	2.2	52	0.5	20	2.2	89	3.1	1,150	2.8	1,609
7	16.7	645	18.6	759	18.5	335	17.7	410	5.7	218	25.1	999	9.7	3,585	12.2	6,961
8	18.2	704	13.6	561	15.0	273	16.6	385	11.4	439	13.6	540	16.1	5,956	15.5	8,858
9	6.4	249	6.0	247	11.5	209	6.2	143	8.6	331	16.4	651	31.5	11,661	23.7	13,491
10	12.6	489	11.6	478	8.4	153	12.0	278	16.2	621	15.4	611	15.0	5,577	14.4	8,207
11	9.6	370	11.1	456	10.3	187	10.5	242	13.4	514	8.9	354	7.5	2,775	8.6	4,898
12	8.0	310	13.7	564	8.2	149	14.5	335	22.3	856	8.1	322	5.3	1,976	7.9	4,512
13+	3.7	144	8.0	331	5.6	101	12.5	289	17.5	673	6.7	267	2.7	991	4.9	2,796
Total	100	3,866	100	4,125	100	1,815	100	2,314	100	3,845	100	3,975	100	37,057	100	56,997

Table 2. Age composition of Pacific herring spawning populations expressed in percent age by number for districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991.

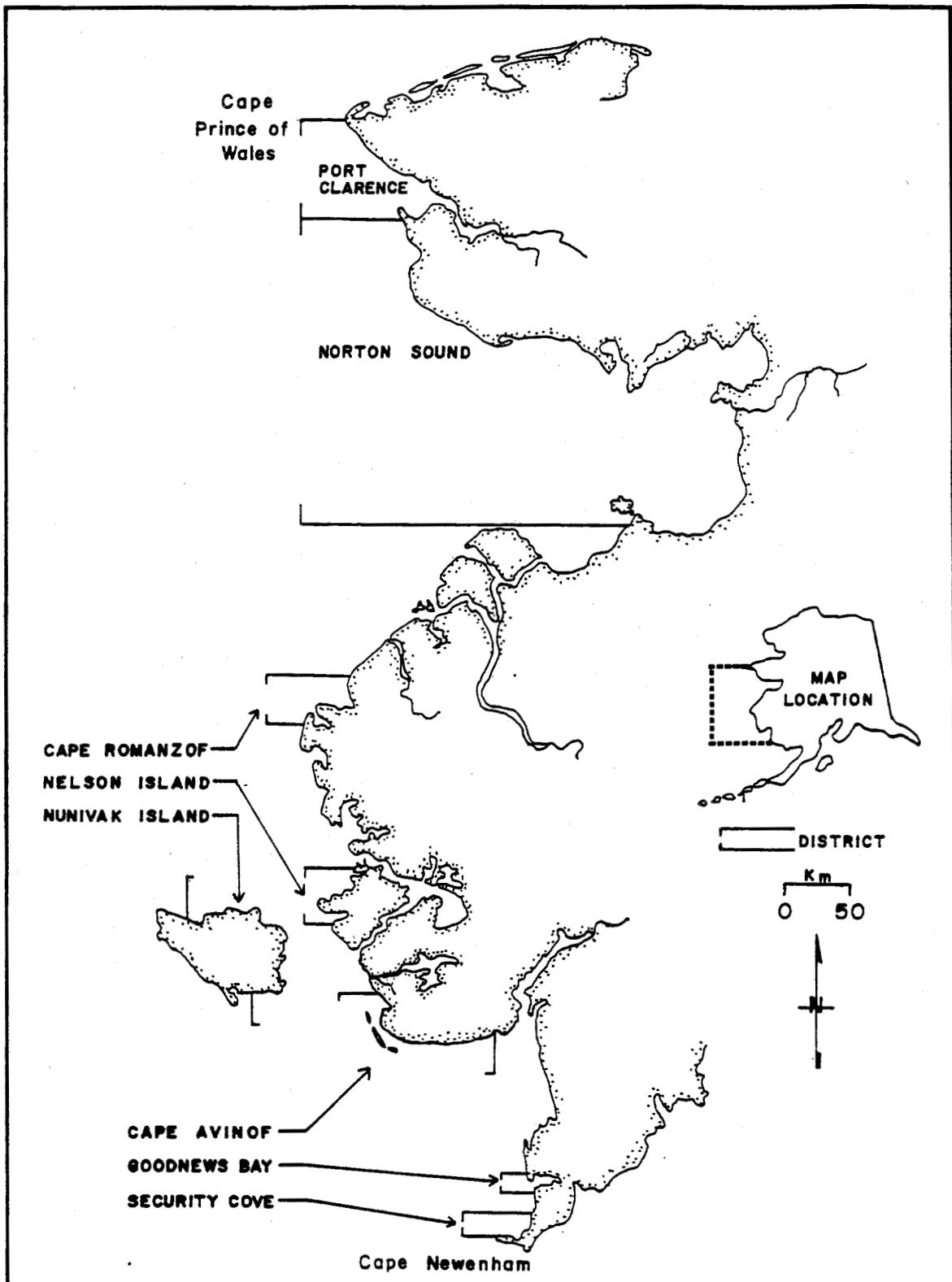


Figure 1. Commercial herring fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991.

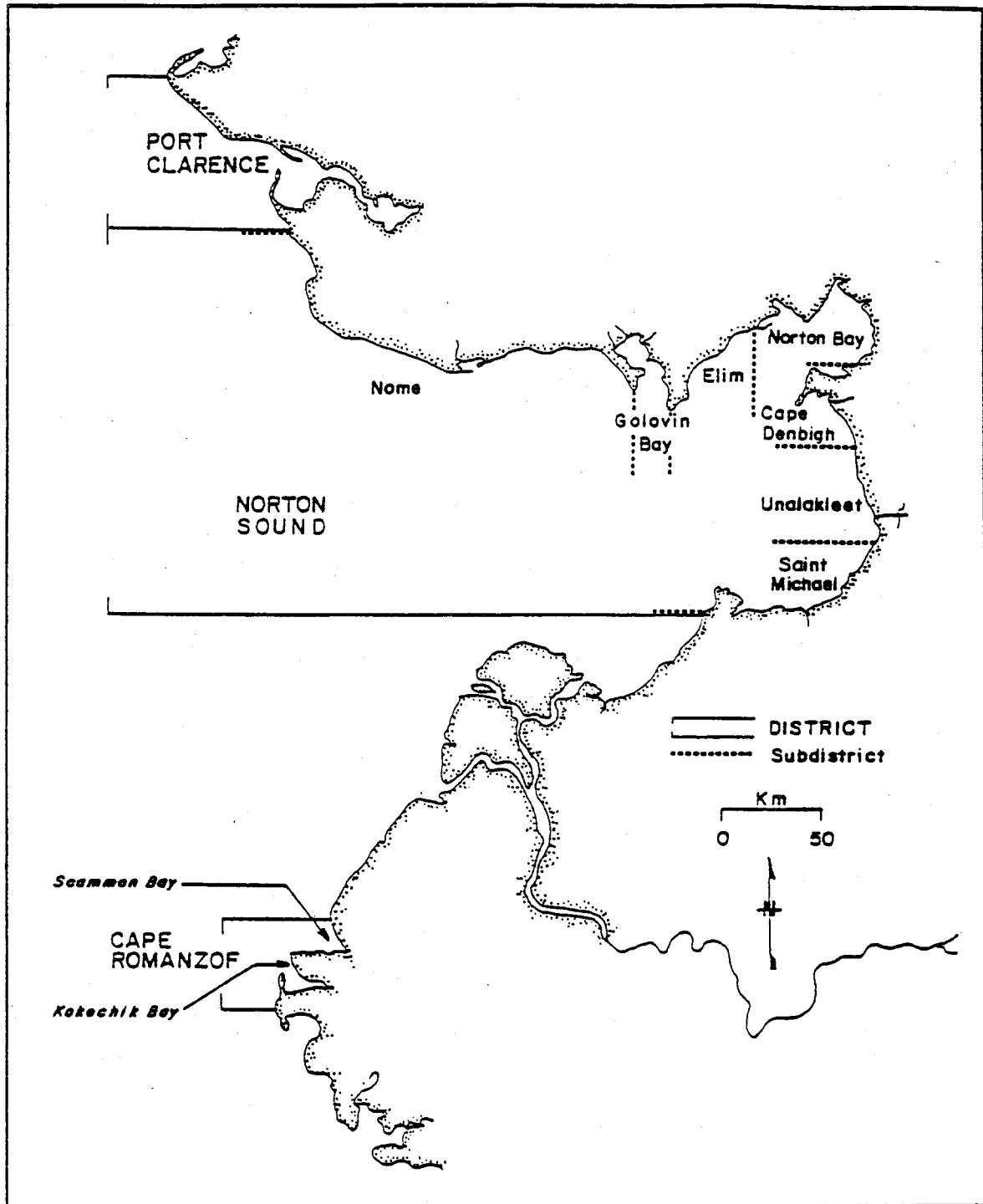


Figure 2. Commercial herring fishing districts and subdistricts of Norton Sound and Cape Romanzof, Arctic-Yukon-Kuskokwim Region, Alaska, 1991.

PERCENT BY NUMBER

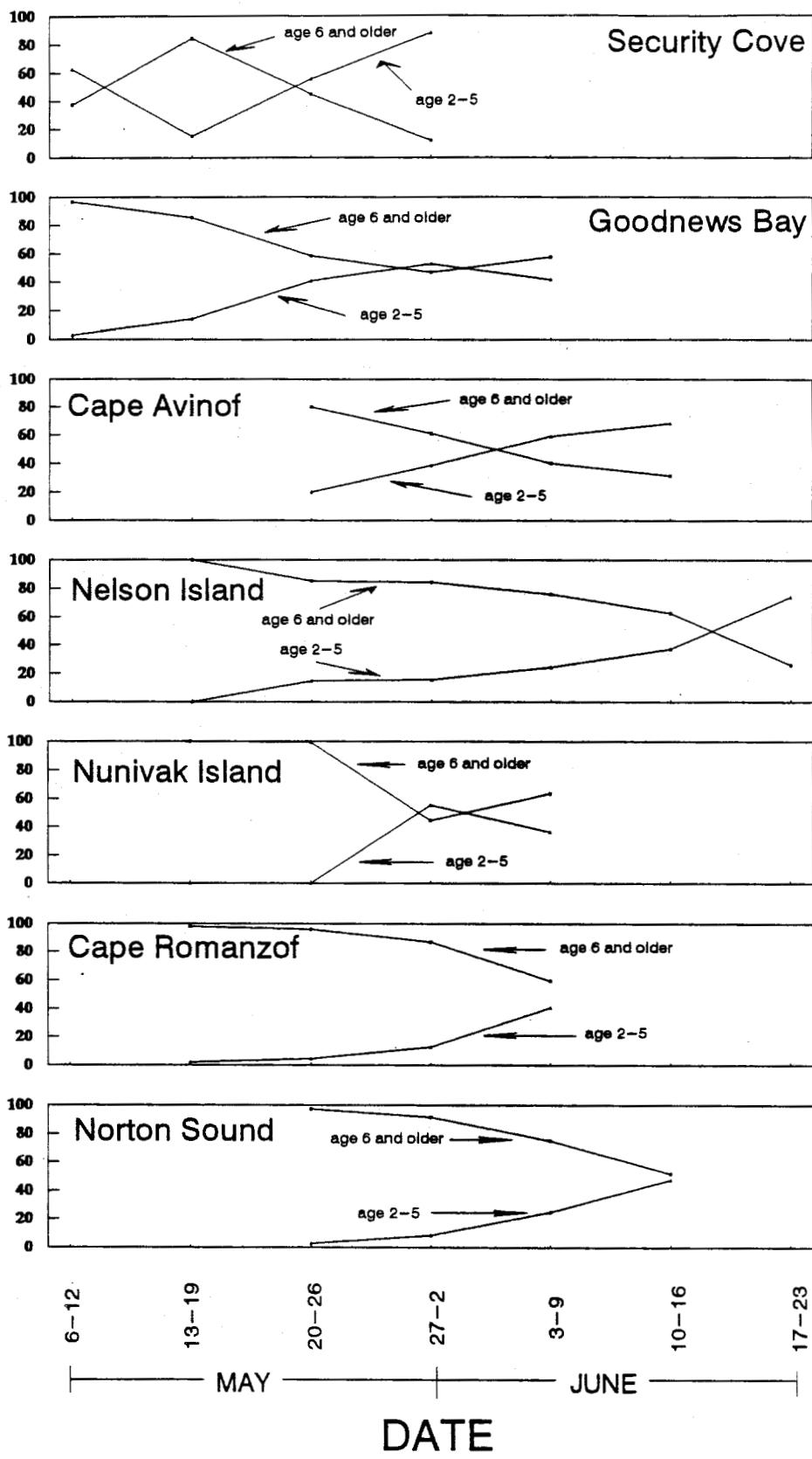


Figure 3. Spawning time comparison of Pacific herring grouped by ages 2 to 5 and age 6 and older for districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991.

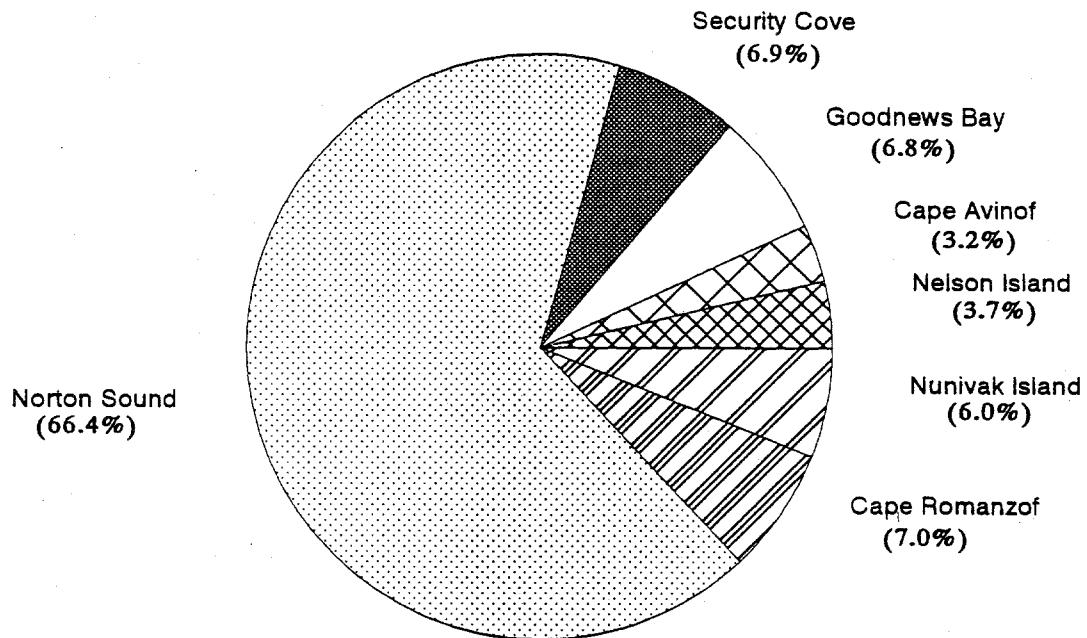


Figure 4. Pacific herring total run biomass distribution by commercial fishing district, Arctic-Yukon-Kuskokwim Region, Alaska, 1991.

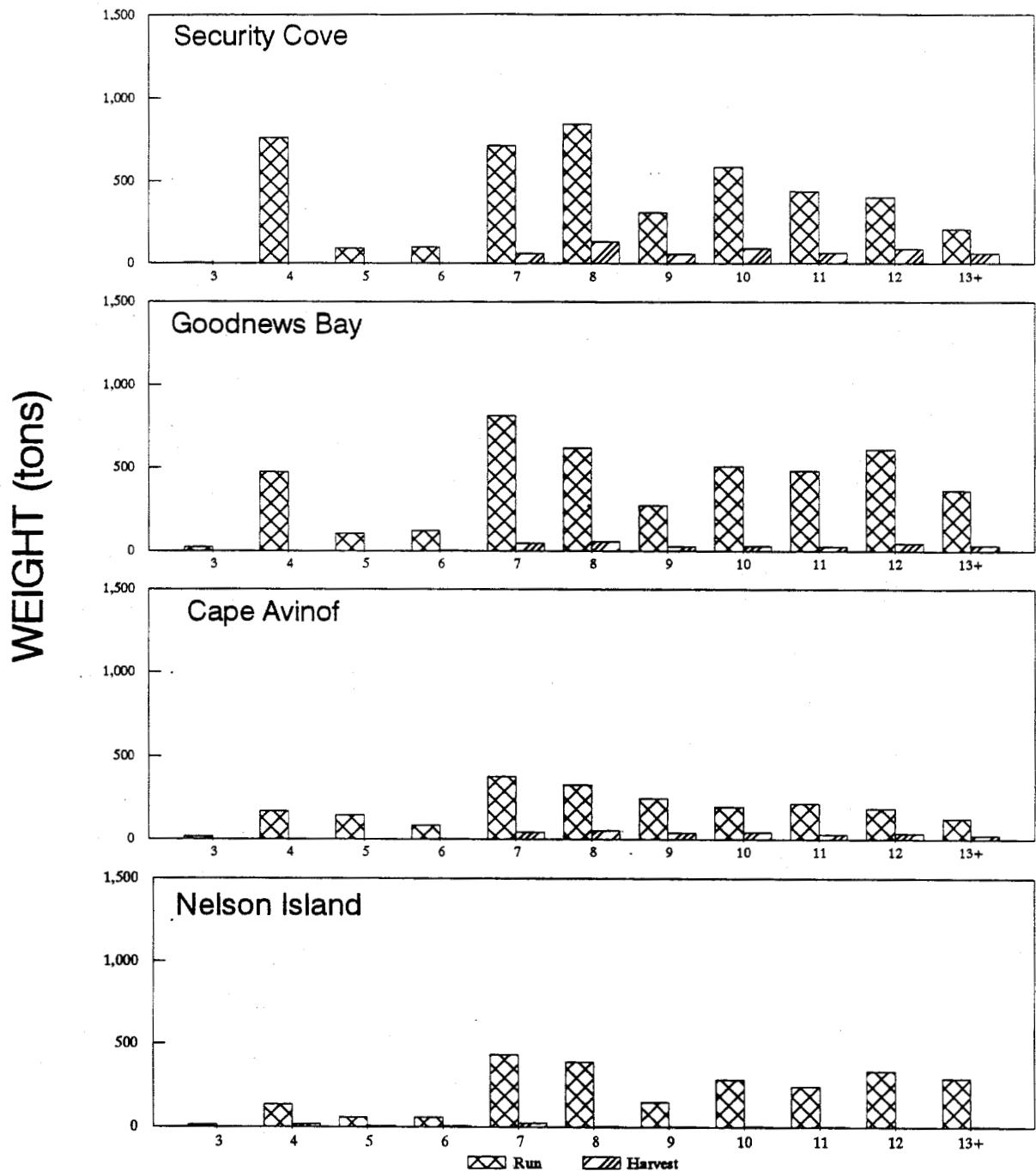


Figure 5. Age composition of Pacific herring for the run and harvest for the Security Cove, Goodnews Bay, Cape Avinof, and Nelson Island Districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991.

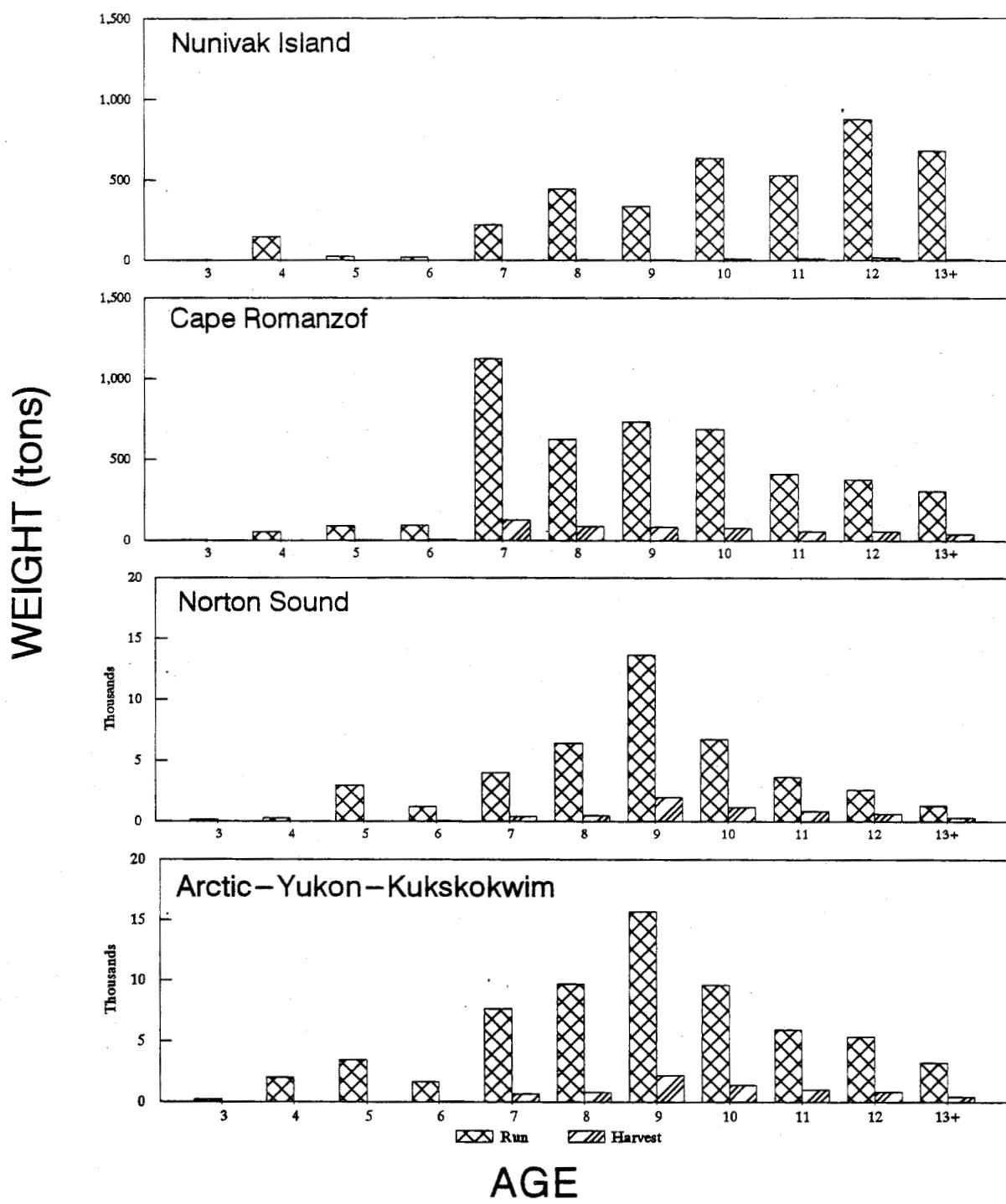


Figure 6. Age composition of Pacific herring for the run and harvest for the Nunivak Island, Cape Romanzof, and Norton Sound Districts, and the Arctic-Yukon-Kuskokwim Region combined, Alaska, 1991.

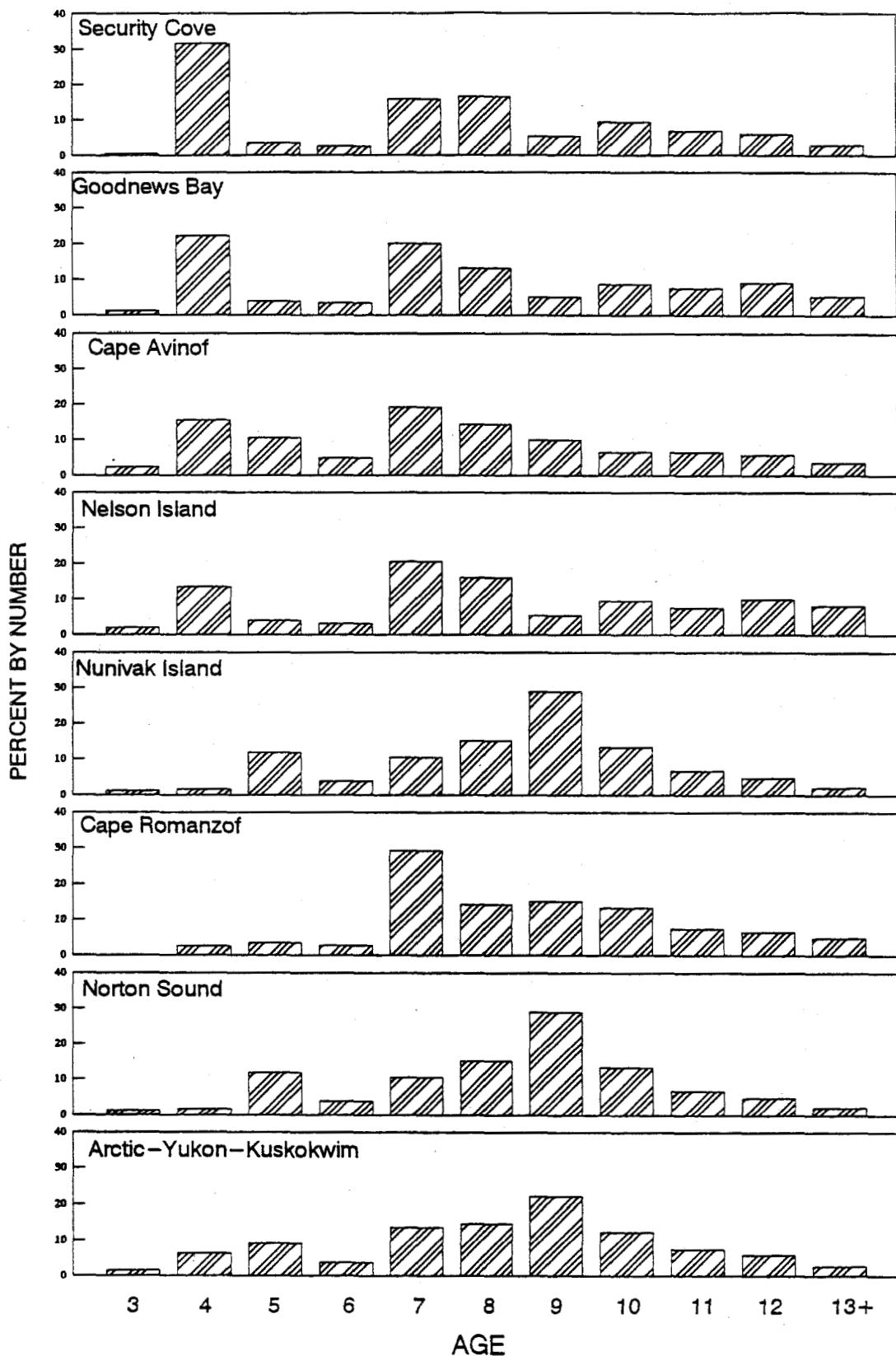


Figure 7. Age composition of Pacific herring spawning populations for commercial fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 1991.

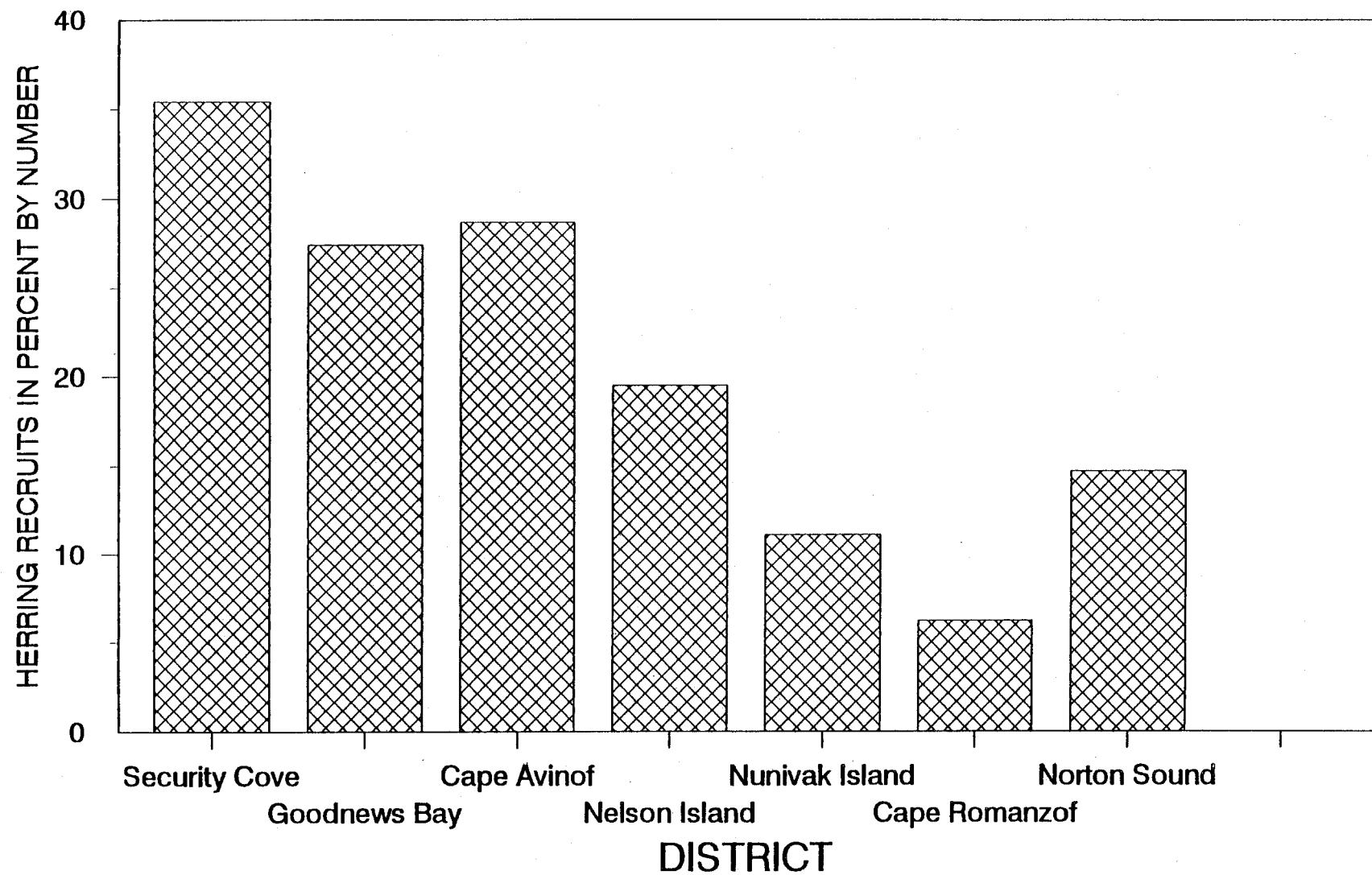


Figure 8. Pacific herring recruits (ages 3, 4, and 5) for commercial fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska 1991.

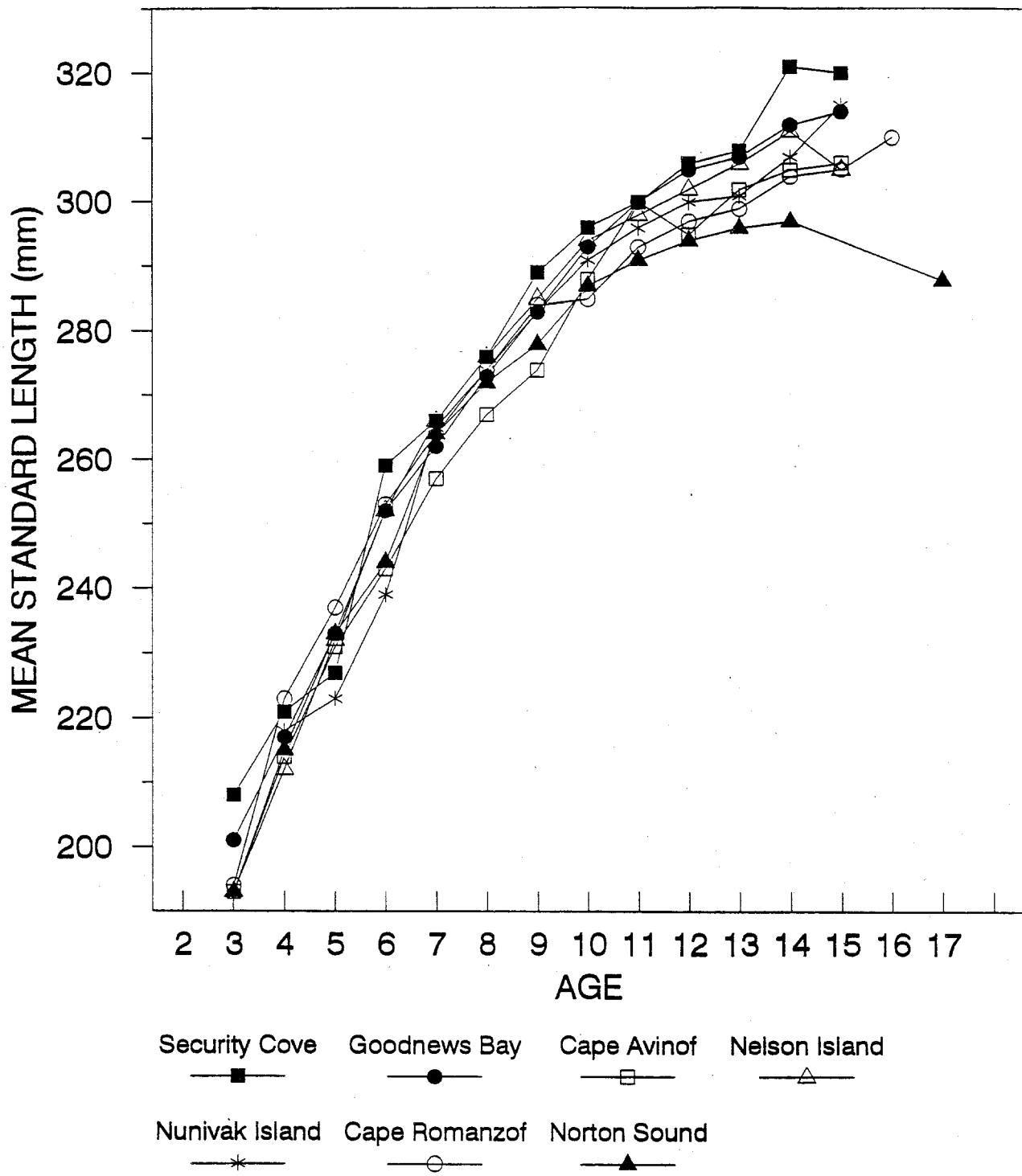


Figure 9. Mean standard length of sampled Pacific herring by age class and commercial fishing district, Arctic-Yukon-Kuskowim Region, Alaska, 1991.

APPENDIX

Appendix A. (p. 1 of 2)

MEMORANDUM

State of Alaska

TO: Charlie Lean DATE: October 19, 1988
Area Management Biologist
Division of Commercial Fisheries FILE NO:
Department of Fish and Game
Nome
TELEPHONE NO: (907) 267-2379

FROM: Robert Conrad SUBJECT: Sample Sizes for
Biometrist, Region III Age Composition
Division of Commercial Fisheries Samples
Department of Fish and Game
Anchorage

As a follow-up to our conversation last week in Nome concerning sample sizes for age-sex-size sampling, here are some guidelines to help you develop plans for next season's sampling. First, I must stress that the suggested sample sizes are only for sampling that is conducted to estimate age composition. Other uses of these data (such as for stock composition analysis) require larger sample sizes. Also, to assure you that these numbers have statistical validity, the suggested sample sizes are from the following paper: "Thompson, S. K. 1987. Sample size for estimating multinomial proportions. The American Statistician 41(1):42-46". The methods used to derive these suggested sample sizes have been accepted by nearly all biometricalians in the Department.

To determine the sample size desired for a particular time and/or area stratum, you first must decide what level of accuracy and precision you want for your age composition estimate. For example, you might want the estimated age composition to be within \pm 5% (precision) of the true age composition of the stratum 95% of the time (accuracy) i.e., if you repeated the sampling 100 times, 95 of the samples would include the true age composition within \pm 5% of the age composition estimated for that sample). For the most commonly used levels of accuracy and precision, the following are the suggested sample sizes (the number of age classes is not important to these numbers):

<u>Precision</u>	<u>Accuracy</u>	<u>Suggested Sample Size</u>
95%	± 5%	510
95%	± 10%	128
90%	± 5%	403
90%	± 10%	101

Appendix A. (p. 2 of 2)

Lean

October 19, 1988

The above numbers need to be increased to account for scale regeneration and other sources which cause a scale to be non-readable. So, if commonly 15% of the scales collected from a particular fishery cannot be read, the suggested sample size would be increased by 15%. For fisheries (or escapements) which are not the subject of allocation issues but for which the age composition estimates are used for management decisions, I would recommend 95% accuracy with \pm 10% precision for each time and/or area stratum.

One word of caution on these sample sizes: because they are usually substantially smaller than the previous goals, it is important that the sampling procedure used to collect the scales is a random process. With the larger sample sizes, it was usually necessary to sample more than one delivery (or test net catch) to obtain the desired sample size, thereby getting some randomness by default. With these smaller numbers, it might be tempting to collect all the scales from a single delivery or catch. I cannot stress the importance of designing your sampling so that a random sample of the entire catch or escapement for a time and/or stratum is collected.

If there are any questions, please contact me.

CC. R. Randall
R. Cannon
L. Buklis
H. Hamner
S. Merkouris

Appendix B.1. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Security Cove District, 1991.

Sample Dates	Age	Sex (number)			Percent of Total	Weight		Length			
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
13 May	2										
	3										
	4										
	5										
	6										
	7	3	5	0	8	13.6	307	28.4	8	275	9.7
	8	9	11	0	20	33.9	335	35.4	20	281	8.3
	9	3	1	0	4	6.8	383	66.0	4	291	7.5
	10	3	4	0	7	11.9	388	63.4	7	294	12.0
	11	4	4	0	8	13.6	435	52.3	8	304	8.7
	12	2	3	0	5	8.5	461	27.7	5	308	6.6
	13	3	3	0	6	10.2	495	52.3	6	316	12.5
	14	0	1	0	1	1.7	578		1	323	1
	15										
	16										
	17										
Sample Total		27	32	0	59	100.0	385	78.9	59	292	16.7
											59
17 May	2										
	3										
	4										
	5										
	6	0	1	0	1	0.5	300		1	267	1
	7	10	18	0	28	13.7	308	39.4	28	276	9.7
	8	18	31	1	50	24.4	333	42.3	50	282	7.8
	9	14	11	0	25	12.2	357	50.7	25	286	10.6
	10	21	14	0	35	17.1	390	50.7	35	298	11.2
	11	12	8	0	20	9.8	412	45.1	20	305	11.2
	12	15	15	0	30	14.6	447	41.5	30	308	7.0
	13	7	6	0	13	6.3	455	64.8	13	308	12.0
	14	2	1	0	3	1.5	485	28.6	3	317	3.1
	15										
	16										
	17										
Sample Total		99	105	1	205	100.0	377	68.4	205	293	15.5
											204
All Periods Combined 13 - 17 May	2										
	3										
	4										
	5										
	6	0	1	0	1	0.4	300		1	267	1
	7	13	23	0	36	13.6	308	36.9	36	276	9.6
	8	27	42	1	70	26.5	334	40.2	70	282	7.9
	9	17	12	0	29	11.0	360	52.5	29	287	10.2
	10	24	18	0	42	15.9	390	52.2	42	298	11.3
	11	16	12	0	28	10.6	419	47.4	28	305	10.4
	12	17	18	0	35	13.3	449	39.8	35	308	6.8
	13	10	9	0	19	7.2	467	62.6	19	310	12.4
	14	2	2	0	4	1.5	509	51.9	4	318	4.0
	15										
	16										
	17										
All Samples Combined		126	137	1	264	100.0	378	70.8	264	292	15.8
Sex Composition (%)		47.9	52.1								263
Not Aged		9	13	0	22	8.3	375	74.6	22	293	19.6
Sex Composition (%)		40.9	59.1								22

Appendix B.2. Age, sex, and size composition of herring sampled from the commercial gillnet harvest,
Goodnews Bay District, 1991.

Sample Dates	Age	Sex (number)			Percent of Total	Weight		Length				
		Male	Female	Unknown		Total	Mean (g)	Number Weighed	Mean (mm)	SD	Number Measured	
	2											
	3											
	4											
	5											
	6	1	1	0	2	0.8	274	76.4	2	264	19.1	2
	7	21	30	0	51	21.5	285	34.5	51	268	8.7	51
	8	24	32	0	56	23.6	319	39.0	56	278	9.1	56
22 May	9	12	12	0	24	10.1	331	39.5	24	282	11.2	24
	10	16	11	0	27	11.4	357	38.6	27	290	11.6	27
	11	13	8	0	21	8.9	378	55.8	21	294	12.4	21
	12	17	16	0	33	13.9	435	50.6	33	305	10.0	33
	13	9	9	0	18	7.6	453	61.1	18	309	11.0	18
	14	2	3	0	5	2.1	452	71.1	5	310	12.0	5
	15											
	16											
	17											
All Samples Combined		115	122	0	237	100.0	351	72.5	237	286	17.4	237
Sex Composition (%)		48.5	51.5									
Not Aged		1	3	0	4	1.7	303	51.0	4	278	18.6	4
Sex Composition (%)		25.0	75.0									

Appendix B.3. Age, sex, and size composition of herring sampled from the commercial gillnet harvest,
Cape Avinof District, 1991.

Sample Dates	Age	Sex (number)			Percent of Total	Weight		Length				
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured	
26 May	2											
	3											
	4											
	5											
	6	0	2	0	2	2.4	256	22.6	2	258	4.9	2
	7	10	10	0	20	24.4	268	23.8	20	264	6.1	20
	8	9	16	0	25	30.5	293	34.5	25	269	9.5	25
	9	4	7	0	11	13.4	327	27.3	11	276	5.0	11
	10	3	2	0	5	6.1	359	39.6	5	293	14.7	5
	11	4	3	0	7	8.5	399	52.4	7	299	11.8	7
	12	3	5	0	8	9.8	383	97.2	8	292	15.9	8
	13	3	1	0	4	4.9	420	29.7	4	305	3.6	4
	14											
	15											
	16											
	17											
Sample Total		36	46	0	82	100.0	319	65.2	82	276	16.5	82
27 May	2											
	3											
	4											
	5											
	6											
	7	17	19	0	36	22.9	297	31.6	36	272	8.2	36
	8	15	17	0	32	20.4	314	34.7	32	274	10.0	32
	9	15	14	0	29	18.5	344	50.3	29	284	13.9	29
	10	15	9	0	24	15.3	376	43.6	24	294	10.9	24
	11	8	7	0	15	9.6	392	65.5	15	301	12.9	15
	12	7	7	0	14	8.9	411	74.1	14	302	15.3	14
	13	5	2	0	7	4.5	403	69.3	7	299	13.0	7
	14											
	15											
	16											
	17											
Sample Total		82	75	0	157	100.0	345	62.0	157	284	16.3	157
29 May	2											
	3											
	4											
	5											
	6	1	1	0	2	1.6	274	17.0	2	263	0.0	2
	7	10	15	0	25	20.5	282	33.4	25	270	7.4	25
	8	10	17	0	27	22.1	316	39.1	27	276	10.3	27
	9	4	10	0	14	11.5	354	56.6	14	284	12.5	14
	10	12	12	0	24	19.7	377	54.8	24	293	14.6	24
	11	6	6	0	12	9.8	403	82.2	12	301	12.9	12
	12	3	8	0	11	9.0	422	34.3	11	305	10.2	11
	13	3	3	0	6	4.9	431	73.4	6	307	6.4	6
	14	0	1	0	1	0.8	390		1	304		1
	15											
	16											
	17											
Sample Total		49	73	0	122	100.0	349	70.4	122	286	17.1	122

-Continued-

Appendix B.3. (p. 2 of 2)

Sample Dates	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
31 May	2											
	3											
	4											
	5											
	6											
	7	1	6	0	7	8.0	286	57.9	7	269	11.3	7
	8	9	6	0	15	17.0	316	39.1	15	277	13.0	15
	9	5	5	0	10	11.4	343	55.7	10	286	11.7	10
	10	8	5	0	13	14.8	370	59.1	13	299	7.1	13
	11	3	7	0	10	11.4	347	57.4	10	294	11.6	10
	12	12	8	0	20	22.7	387	49.2	20	305	11.6	20
	13	5	7	0	12	13.6	378	49.8	12	304	14.4	12
	14	1	0	0	1	1.1	402		1	300		1
	15											
	16											
	17											
Sample Total		44	44	0	88	100.0	354	59.1	88	293	16.6	88
All Periods Combined 26 - 31 May	2											
	3											
	4											
	5											
	6	1	3	0	4	0.9	265	19.4	4	260	4.3	4
	7	38	50	0	88	19.6	285	34.6	88	269	8.3	88
	8	43	56	0	99	22.0	309	37.3	99	274	10.7	99
	9	28	36	0	64	14.3	343	49.1	64	283	12.3	64
	10	38	28	0	66	14.7	374	50.0	66	294	12.0	66
	11	21	23	0	44	9.8	386	68.4	44	299	12.3	44
	12	25	28	0	53	11.8	400	63.3	53	302	13.5	53
	13	16	13	0	29	6.5	401	59.4	29	304	11.6	29
	14	1	1	0	2	0.4	396	8.5	2	302	2.8	2
	15											
	16											
	17											
All Samples Combined		211	238	0	449	100.0	343	65.3	449	285	17.4	449
Sex Composition (%)		47.0	53.0									
Not Aged		10	15	0	25	5.6	357	73.3	25	292	21.3	25
Sex Composition (%)		40.0	60.0									

Appendix B.4. Age, sex, and size composition of herring sampled from the commercial gillnet harvest,
Nunivak Island District, 1991.

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
20 May	2										
	3										
	4										
	5										
	6										
	7										
	8	2	0	0	2	5.3	342	5.7	2	278	10.6
	9	2	0	0	2	5.3	323	9.9	2	273	3.5
	10	4	3	0	7	18.4	381	42.6	7	296	7.3
	11	8	1	0	9	23.7	370	32.1	9	294	11.4
	12	8	3	0	11	28.9	380	41.0	11	297	11.7
	13	6	1	0	7	18.4	391	35.2	7	302	6.4
	14										
	15										
	16										
	17										
Sample Total		30	8	0	38	100.0	375	38.1	38	295	11.8
											38
24 May	2										
	3										
	4										
	5										
	6	1	0	0	1	1.4	296		1	282	
	7	3	0	0	3	4.3	260	12.2	3	277	4.6
	8	6	4	0	10	14.3	309	25.2	10	285	7.1
	9	3	3	0	6	8.6	331	57.4	6	292	13.5
	10	7	5	0	12	17.1	353	39.7	12	296	10.3
	11	8	6	0	14	20.0	379	44.5	14	305	10.8
	12	12	7	0	19	27.1	385	43.5	19	304	13.1
	13	2	3	0	5	7.1	411	39.4	5	310	7.0
	14										
	15										
	16										
	17										
Sample Total		42	28	0	70	100.0	358	54.0	70	298	13.6
											70
All Periods Combined 20 - 24 May	2										
	3										
	4										
	5										
	6	1	0	0	1	0.9	296		1	282	
	7	3	0	0	3	2.8	260	12.2	3	277	4.6
	8	8	4	0	12	11.1	315	26.2	12	284	7.8
	9	5	3	0	8	7.4	329	48.8	8	287	14.5
	10	11	8	0	19	17.6	363	41.9	19	296	9.1
	11	16	7	0	23	21.3	376	39.5	23	300	12.0
	12	20	10	0	30	27.8	383	41.9	30	302	12.8
	13	8	4	0	12	11.1	400	36.6	12	306	7.6
	14										
	15										
	16										
	17										
All Samples Combined		72	36	0	108	100.0	364	49.5	108	297	13.1
Sex Composition (%)		66.7	33.3								108
Not Aged		19	8	0	27	25.0	383	60.5	27	299	12.9
Sex Composition (%)		70.4	29.6								27

Appendix B.5. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Kokechik Bay area, Cape Romanzof District, 1991.

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
21 May	2										
	3										
	4										
	5	0	1	0	1	0.5	208	1	242	1	
	6	1	1	0	2	1.0	240	2	252	7.8	2
	7	34	23	0	57	28.9	275	57	262	7.7	57
	8	20	11	0	31	15.7	318	31	274	11.3	31
	9	16	17	0	33	16.8	347	33	280	9.6	33
	10	14	8	0	22	11.2	385	22	286	10.9	22
	11	11	7	0	18	9.1	387	18	290	9.1	18
	12	12	9	0	21	10.7	426	21	297	16.0	21
	13	5	6	0	11	5.6	447	11	302	16.5	11
	14	0	1	0	1	0.5	522	1	312		1
	15										
	16										
	17										
Sample Total		113	84	0	197	100.0	343	76.2	197	278	17.3
											197
22 May	2										
	3										
	4										
	5										
	6										
	7	30	25	0	55	27.2	298	55	270	9.2	55
	8	20	16	0	36	17.8	329	36	277	9.5	36
	9	14	16	0	30	14.9	356	30	284	9.3	30
	10	9	17	0	26	12.9	385	26	289	11.3	26
	11	9	7	0	16	7.9	426	16	298	12.0	16
	12	9	12	0	21	10.4	426	21	299	10.6	21
	13	3	8	0	11	5.4	428	11	301	15.6	11
	14	2	4	0	6	3.0	489	6	310	6.5	6
	15	1	0	0	1	0.5	515	1	322		1
	16										
	17										
Sample Total		97	105	0	202	100.0	361	69.9	202	284	15.8
											202
23 May	2										
	3										
	4										
	5										
	6	2	2	0	4	2.1	260	4	265	3.9	4
	7	35	25	0	60	31.3	278	60	267	10.5	60
	8	24	12	0	36	18.8	311	36	277	20.9	36
	9	16	12	0	28	14.6	333	28	286	23.1	28
	10	22	9	0	31	16.1	357	31	292	17.7	31
	11	11	8	0	19	9.9	406	19	300	21.8	19
	12	7	2	0	9	4.7	395	9	298	9.3	9
	13	1	2	0	3	1.6	347	3	287	35.6	3
	14	1	1	0	2	1.0	463	2	305	9.9	2
	15										
	16										
	17										
Sample Total		119	73	0	192	100.0	326	63.6	192	281	21.3
											192

-Continued-

Appendix B.5. (p. 2 of 2)

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2										
	3										
	4										
All Periods Combined	5	0	1	0	1	0.2	208	1	242	1	
21 - 23 May	6	3	3	0	6	1.0	253	19.8	6	260	8.1
	7	99	73	0	172	29.1	283	35.4	172	266	9.8
	8	64	39	0	103	17.4	320	39.9	103	276	14.8
	9	46	45	0	91	15.4	346	42.2	91	283	15.1
	10	45	34	0	79	13.4	374	52.8	79	290	14.1
	11	31	22	0	53	9.0	405	53.7	53	296	15.9
	12	28	23	0	51	8.6	420	67.1	51	298	12.7
	13	9	16	0	25	4.2	427	80.0	25	300	18.5
	14	3	6	0	9	1.5	487	41.8	9	309	6.7
	15	1	0	0	1	0.2	515		1	322	1
	16										
	17										
All Samples Combined		329	262	0	591	100.0	343	71.5	591	281	18.4
Sex Composition (%)		55.7	44.3								
Not Aged		27	23	0	50	8.5	351	70.9	50	282	16.3
Sex Composition (%)		54.0	46.0								

Appendix B.6. Age, sex, and size composition of herring sampled from the commercial gillnet harvest,
Unalakleet Subdistrict, Norton Sound District, 1991.

Sample Dates	Age	Sex (number)			Percent of Total	Weight		Length				
		Male	Female	Unknown		Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6	1	0	0	1	1.0	297		1	258	1	
	7	3	4	0	7	6.9	319	21.4	7	267	3.8	7
	8	6	6	0	12	11.8	346	29.0	12	277	4.0	12
24 May	9	13	11	0	24	23.5	373	38.7	24	282	8.6	24
	10	14	18	0	32	31.4	381	40.3	32	284	11.1	32
	11	7	4	0	11	10.8	408	39.2	11	289	5.4	11
	12	8	2	0	10	9.8	401	38.5	10	290	10.0	10
	13	2	2	0	4	3.9	424	22.6	4	294	11.2	4
	14	0	1	0	1	1.0	447		1	298		1
	15											
	16											
	17											
All Samples Combined		54	48	0	102	100.0	377	44.4	102	283	10.8	102
Sex Composition (%)		52.9	47.1									
Not Aged		4	10	0	14	13.7	391	40.5	14	286	10.6	14
Sex Composition (%)		28.6	71.4									

Appendix B.7. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Cape Denbigh Subdistrict, Norton Sound District, 1991.

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
24 May	2										
	3										
	4										
	5										
	6	1	1	0	2	0.7	315	12.7	2	274	8.5
	7	14	10	0	24	7.8	311	32.5	24	275	8.4
	8	14	16	0	30	9.8	327	33.1	30	278	7.7
	9	60	48	0	108	35.3	360	31.9	108	285	8.1
	10	40	17	0	57	18.6	373	41.7	57	289	9.8
	11	21	20	0	41	13.4	397	37.2	41	293	8.2
	12	14	15	0	29	9.5	408	46.6	29	295	10.8
	13	7	5	0	12	3.9	434	35.6	12	301	10.1
	14	2	1	0	3	1.0	447	58.3	3	299	13.9
	15										
	16										
	17										
Sample Total		173	133	0	306	100.0	368	47.8	306	287	11.0
25 May	2										
	3										
	4										
	5										
	6										
	7	3	4	0	7	4.8	325	26.8	7	277	10.4
	8	4	2	1	7	4.8	357	39.9	7	286	9.9
	9	27	36	0	63	42.9	379	39.4	63	291	8.9
	10	7	16	0	23	15.6	382	66.3	23	296	11.3
	11	11	15	0	26	17.7	406	34.4	25	296	8.5
	12	6	10	0	16	10.9	431	44.4	16	303	10.1
	13	1	4	0	5	3.4	433	21.9	5	308	3.3
	14										
	15										
	16										
	17										
Sample Total		59	87	1	147	100.0	388	49.5	146	294	11.1
All Periods Combined 24 - 25 May	2										
	3										
	4										
	5										
	6	1	1	0	2	0.4	315	12.7	2	274	8.5
	7	17	14	0	31	6.8	314	31.5	31	275	8.8
	8	18	18	1	37	8.2	333	35.9	37	279	8.6
	9	87	84	0	171	37.7	367	36.0	171	287	8.9
	10	47	33	0	80	17.7	376	49.7	80	291	10.7
	11	32	35	0	67	14.8	401	36.2	66	294	8.3
	12	20	25	0	45	9.9	417	46.6	45	298	11.2
	13	8	9	0	17	3.8	434	31.5	17	303	9.1
	14	2	1	0	3	0.7	447	58.3	3	299	13.9
	15										
	16										
	17										
All Samples Combined		232	220	1	453	100.0	375	49.2	452	289	11.4
Sex Composition (%)		51.3	48.7								
Not Aged		13	18	0	31	6.8	382	42.0	31	290	11.3
Sex Composition (%)		41.9	58.1								

Appendix B.8. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Unalakleet/Cape Denbigh Subdistricts combined, Norton Sound District, 1991.

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
24 May	2										
	3										
	4										
	5										
	6	2	1	0	3	0.7	309	13.7	3	269	11.0
	7	17	14	0	31	7.6	313	30.2	31	273	8.2
	8	20	22	0	42	10.3	332	32.8	42	278	6.8
	9	73	59	0	132	32.4	362	33.5	132	284	8.2
	10	54	35	0	89	21.8	376	41.1	89	287	10.5
	11	28	24	0	52	12.7	400	37.5	52	292	7.8
	12	22	17	0	39	9.6	406	44.3	39	293	10.7
	13	9	7	0	16	3.9	432	32.5	16	299	10.5
	14	2	2	0	4	1.0	447	47.6	4	299	11.3
	15										
	16										
	17										
Sample Total		227	181	0	408	100.0	371	47.0	408	286	11.0
											408
25 May	2										
	3										
	4										
	5										
	6										
	7	3	4	0	7	4.8	325	26.8	7	277	10.4
	8	4	2	1	7	4.8	357	39.9	7	286	9.9
	9	27	36	0	63	42.9	379	39.4	63	291	8.9
	10	7	16	0	23	15.6	382	66.3	23	296	11.3
	11	11	15	0	26	17.7	406	34.4	25	296	8.5
	12	6	10	0	16	10.9	431	44.4	16	303	10.1
	13	1	4	0	5	3.4	433	21.9	5	308	3.3
	14										
	15										
	16										
	17										
Sample Total		59	87	1	147	100.0	388	49.5	146	294	11.1
											147
All Periods Combined 24 - 25 May	2										
	3										
	4										
	5										
	6	2	1	0	3	0.5	309	13.7	3	269	11.0
	7	20	18	0	38	6.8	315	29.7	38	274	8.7
	8	24	24	1	49	8.8	336	34.5	49	279	7.8
	9	100	95	0	195	35.1	367	36.3	195	286	9.0
	10	61	51	0	112	20.2	377	47.1	112	289	11.2
	11	39	39	0	78	14.1	402	36.4	77	294	8.1
	12	28	27	0	55	9.9	414	45.4	55	296	11.4
	13	10	11	0	21	3.8	432	29.8	21	301	9.9
	14	2	2	0	4	0.7	447	47.6	4	299	11.3
	15										
	16										
	17										
All Samples Combined		286	268	1	555	100.0	375	48.3	554	288	11.5
Sex Composition (%)		51.6	48.4								555
Not Aged		17	28	0	45	8.1	385	41.3	45	289	11.1
Sex Composition (%)		37.8	62.2								45

Appendix B.9. Age, sex, and size composition of herring sampled from the commercial beach seine harvest, Unalakleet Subdistrict, Norton Sound District, 1991.

Sample Dates	Age	Sex (number)			Percent of Total	Weight		Length				
		Male	Female	Unknown		Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4	1	0	0	1	0.3	110		1	203		1
	5	4	3	0	7	1.9	194	22.1	7	239	6.8	7
	6	4	5	0	9	2.5	281	56.6	9	261	15.5	9
	7	31	27	0	58	16.2	284	35.1	56	264	9.1	58
	8	27	21	0	48	13.4	325	49.6	48	273	10.5	48
25 May	9	57	45	0	102	28.4	353	45.7	102	278	10.2	102
	10	37	22	0	59	16.4	383	41.4	59	286	10.2	59
	11	19	12	0	31	8.6	405	48.2	30	291	9.5	31
	12	13	14	0	27	7.5	421	42.9	27	293	9.8	27
	13	4	6	0	10	2.8	445	45.5	10	298	10.3	10
	14	3	3	0	6	1.7	382	97.8	6	286	19.7	6
	15	1	0	0	1	0.3	445		1	284		1
	16											
	17											
All Samples Combined		201	158	0	359	100.0	351	68.0	356	278	15.7	359
Sex Composition (%)		56.0	44.0									
Not Aged		16	15	0	31	8.6	367	61.0	31	281	12.4	31
Sex Composition (%)		51.6	48.4									

Appendix B.10. Age, sex, and size composition of herring sampled from the commercial beach seine harvest, Cape Denbigh Subdistrict, Norton Sound District, 1991.

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length			
		Male	Female	Unknown		Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5	1	0	0	1	0.4	221		1	244		1
	6	0	2	0	2	0.9	312	128.0	2	270	39.6	2
	7	24	20	2	46	20.3	323	65.9	46	268	15.4	46
	8	22	11	1	34	15.0	351	48.2	34	274	11.3	34
23 May	9	26	27	0	53	23.3	361	41.5	53	276	9.0	53
	10	22	22	1	45	19.8	380	61.9	45	281	12.9	45
	11	10	6	0	16	7.0	381	60.2	16	279	14.3	16
	12	10	10	0	20	8.8	420	55.1	20	292	14.4	20
	13	3	4	0	7	3.1	415	73.0	7	289	18.3	7
	14	0	3	0	3	1.3	498	34.9	3	298	11.7	3
	15											
	16											
	17											
All Samples Combined		118	105	4	227	100.0	364	65.0	227	277	14.9	227
Sex Composition (%)		52.9	47.1									
Not Aged		8	4	1	13	5.7	367	74.7	13	276	15.5	13
Sex Composition (%)		66.7	33.3									

Appendix B.11. Age, sex, and size composition of herring sampled from the commercial beach seine harvest, Cape Denbigh\Unalakleet Subdistricts combined, Norton Sound District, 1991.

Sample Dates	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
23 May	2										
	3										
	4										
	5	1	0	0	1	0.4	221	1	244	1	
	6	0	2	0	2	0.9	312	128.0	270	39.6	2
	7	24	20	2	46	20.3	323	65.9	268	15.4	46
	8	22	11	1	34	15.0	351	48.2	274	11.3	34
	9	26	27	0	53	23.3	361	41.5	276	9.0	53
	10	22	22	1	45	19.8	380	61.9	281	12.9	45
	11	10	6	0	16	7.0	381	60.2	279	14.3	16
	12	10	10	0	20	8.8	420	55.1	292	14.4	20
	13	3	4	0	7	3.1	415	73.0	289	18.3	7
	14	0	3	0	3	1.3	498	34.9	298	11.7	3
	15										
	16										
	17										
Sample Total		118	105	4	227	100.0	364	65.0	227	277	14.9
											227
25 May	2										
	3										
	4	1	0	0	1	0.3	110	1	203	1	
	5	4	3	0	7	1.9	194	22.1	239	6.8	7
	6	4	5	0	9	2.5	281	56.6	261	15.5	9
	7	31	27	0	58	16.2	284	35.1	264	9.1	58
	8	27	21	0	48	13.4	325	49.6	273	10.5	48
	9	57	45	0	102	28.4	353	45.7	278	10.2	102
	10	37	22	0	59	16.4	383	41.4	286	10.2	59
	11	19	12	0	31	8.6	405	48.2	291	9.5	31
	12	13	14	0	27	7.5	421	42.9	293	9.8	27
	13	4	6	0	10	2.8	445	45.5	298	10.3	10
	14	3	3	0	6	1.7	382	97.8	286	19.7	6
	15	1	0	0	1	0.3	445	1	284	1	
	16										
	17										
Sample Total		201	158	0	359	100.0	351	68.0	356	278	15.7
											359
All Periods Combined 23 - 25 May	2										
	3										
	4	1	0	0	1	0.2	110	1	203	1	
	5	5	3	0	8	1.4	198	22.6	240	6.5	8
	6	4	7	0	11	1.9	286	66.0	262	19.0	11
	7	55	47	2	104	17.7	302	54.5	266	12.3	104
	8	49	32	1	82	14.0	336	50.4	273	10.8	82
	9	83	72	0	155	26.5	355	44.3	278	9.9	155
	10	59	44	1	104	17.7	381	51.0	284	11.7	104
	11	29	18	0	47	8.0	397	53.3	287	12.6	47
	12	23	24	0	47	8.0	420	47.9	293	11.9	47
	13	7	10	0	17	2.9	432	58.2	294	14.4	17
	14	3	6	0	9	1.5	421	98.1	290	17.8	9
	15	1	0	0	1	0.2	445	1	284	1	
	16										
	17										
All Samples Combined		319	263	4	586	100.0	356	67.1	583	278	15.4
Sex Composition (%)		54.8	45.2								586
Not Aged		24	19	1	44	7.5	367	64.5	44	279	13.4
Sex Composition (%)		55.8	44.2								44

Appendix B.12. Age, sex, and size composition of herring sampled from the subsistence gillnet harvest,
Nelson Island District, 1991.

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2										
	3										
	4	37	28	0	65	35.7	124	30.6	65	219	8.4
	5	15	7	0	22	12.1	149	38.7	22	228	11.5
	6	9	5	0	14	7.7	232	56.6	14	255	17.5
	7	34	15	0	49	26.9	230	32.7	49	259	11.7
	8	4	5	0	9	4.9	230	34.2	9	263	6.9
3 - 9 June	9	4	5	0	9	4.9	294	44.8	9	284	15.9
	10	5	3	0	8	4.4	304	28.6	8	292	8.4
	11	3	0	0	3	1.6	310	40.0	3	286	12.3
	12	1	0	0	1	0.5	396		1	313	1
	13	1	1	0	2	1.1	408	11.3	2	303	9.9
	14										
	15										
	16										
	17										
All Samples Combined		113	69	0	182	100.0	193	75.6	182	245	27.0
Sex Composition (%)		62.1	37.9								182
Not Aged		2	2	0	4	2.2	149	56.2	4	232	20.3
Sex Composition (%)		50.0	50.0								4

Appendix B.13. Age, sex, and size composition of herring sampled from the educational gillnet catches,
Unalakleet Subdistrict, Norton Sound District, 1991.

Sample Week	Age	Sex (number)			Percent of Total	Weight		Length				
		Male	Female	Unknown		Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6											
	7											
27 May - 2 June	8	1	2	0	3	5.1	352	25.1	3	285	8.7	3
	9	9	9	0	18	30.5	360	30.8	18	291	8.3	18
	10	7	8	0	15	25.4	362	48.2	15	292	9.1	15
	11	5	5	0	10	16.9	370	24.3	10	304	27.7	10
	12	6	4	0	10	16.9	396	32.4	10	301	7.8	10
	13	1	1	0	2	3.4	460	21.9	2	310	7.1	2
	14	1	0	0	1	1.7	301		1	287		1
	15											
	16											
	17											
All Samples Combined		30	29	0	59	100.0	370	40.7	59	295	14.6	59
Sex Composition (%)		50.8	49.2									
Not Aged		6	8	0	14	23.7	364	35.9	14	289	9.1	14
Sex Composition (%)		42.9	57.1									

Appendix B.14. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches Security Cove District, 1991.

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
6 - 12 May	2										
	3										
	4	6	7	0	13	54.2	139	17.8	13	224	7.6
	5	1	1	0	2	8.3	141	18.4	2	224	0.7
	6	0	1	0	1	4.2	154		1	226	
	7	0	1	0	1	4.2	320		1	273	
	8	1	3	0	4	16.7	310	48.5	4	274	11.8
	9	1	0	0	1	4.2	324		1	277	
	10										
	11	1	0	0	1	4.2	582		1	324	
	12										
	13	1	0	0	1	4.2	462		1	295	
	14										
	15										
	16										
	17										
Sample Total		11	13	0	24	100.0	215	124.4	24	244	31.0
											24
13 - 19 May	2										
	3	1	0	0	1	0.2	102		1	200	
	4	35	22	0	57	14.2	148	30.6	57	226	11.1
	5	2	2	0	4	1.0	183	34.1	4	238	10.5
	6	8	3	0	11	2.7	238	41.3	11	257	12.5
	7	51	33	0	84	20.9	274	46.2	84	268	10.3
	8	42	40	0	82	20.4	312	40.7	82	278	10.1
	9	16	15	0	31	7.7	370	49.2	31	292	10.0
	10	31	23	0	54	13.5	388	47.4	54	299	11.6
	11	17	14	0	31	7.7	392	58.1	31	302	11.1
	12	18	17	0	35	8.7	420	53.4	35	309	11.0
	13	3	3	0	6	1.5	434	58.5	6	303	8.1
	14	3	2	0	5	1.2	468	28.2	5	321	8.5
	15										
	16										
	17										
Sample Total		227	174	0	401	100.0	311	98.1	401	277	28.0
											401
20 - 26 May	2										
	3	0	2	0	2	0.5	192	67.9	2	212	7.8
	4	96	90	0	186	49.2	148	35.4	186	220	14.4
	5	10	12	0	22	5.8	167	41.8	22	227	13.2
	6	5	4	0	9	2.4	254	34.5	9	264	11.4
	7	20	20	0	40	10.6	260	45.5	40	264	26.9
	8	28	20	0	48	12.7	289	62.2	48	274	18.7
	9	4	4	0	8	2.1	317	96.1	8	278	27.8
	10	7	10	0	17	4.5	355	50.1	17	289	13.0
	11	17	7	0	24	6.3	381	73.9	24	298	23.2
	12	6	4	0	10	2.6	408	66.0	10	299	16.7
	13	5	4	0	9	2.4	417	40.7	9	314	8.5
	14	0	2	0	2	0.5	464	121.6	2	320	28.3
	15	0	1	0	1	0.3	450		1	320	
	16										
	17										
Sample Total		198	180	0	378	100.0	225	103.5	378	247	36.0
											378

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Appendix B.14. (p. 2 of 2)

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
27 May - 2 June	2											
	3											
	4	29	10	0	39	79.6	127	15.9	39	219	7.3	39
	5	3	1	0	4	8.2	129	15.5	4	219	6.5	4
	6											
	7	0	3	0	3	6.1	223	37.0	3	258	2.1	3
	8	1	0	0	1	2.0	314		1	283		1
	9											
	10	1	1	0	2	4.1	288	31.1	2	293	10.6	2
	11											
	12											
	13											
	14											
	15											
	16											
	17											
Sample Total		34	15	0	49	100.0	143	49.0	49	226	20.1	49
All Weeks Combined	2											
	3	1	2	0	3	0.4	162	70.7	3	208	8.6	3
	4	166	129	0	295	34.6	145	32.6	295	221	13.0	295
	5	16	16	0	32	3.8	163	39.7	32	227	12.4	32
	6	13	8	0	21	2.5	241	42.4	21	259	14.1	21
	7	71	57	0	128	15.0	269	46.5	128	266	17.2	128
	8	72	63	0	135	15.8	304	50.3	135	276	13.9	135
	9	21	19	0	40	4.7	358	63.3	40	289	15.8	40
	10	39	34	0	73	8.6	378	51.6	73	296	12.5	73
	11	35	21	0	56	6.6	390	69.5	56	300	17.5	56
	12	24	21	0	45	5.3	417	55.9	45	306	12.9	45
	13	9	7	0	16	1.9	426	46.8	16	308	10.0	16
	14	3	4	0	7	0.8	467	54.8	7	321	13.5	7
	15	0	1	0	1	0.1	450		1	320		1
	16											
	17											
All Samples Combined		470	382	0	852	100.0	260	111.5	852	260	35.7	852
Sex Composition (%)		55.2	44.8									
Not Aged		59	48	0	107	12.6	319	115.6	107	281	33.7	107
Sex Composition (%)		55.1	44.9									

Appendix B.15. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches, Goodnews Bay District, 1991.

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
6 - 12 May	2										
	3										
	4	5	1	0	6	2.2	149	17.1	6	224	8.4
	5	2	0	0	2	0.7	145	12.7	2	222	9.9
	6	0	3	0	3	1.1	262		1	263	6.7
	7	16	16	0	32	11.9	295	39.8	25	271	9.2
	8	22	18	0	40	14.9	330	44.6	31	279	9.7
	9	11	5	0	16	6.0	375	60.2	14	288	8.6
	10	30	14	0	44	16.4	399	59.4	33	298	10.5
	11	24	14	0	38	14.2	424	63.2	29	302	9.6
	12	26	29	0	55	20.5	454	55.7	36	308	9.5
	13	14	11	0	25	9.3	447	64.9	19	306	10.1
	14	2	3	0	5	1.9	485	82.2	3	314	6.5
	15	0	2	0	2	0.7	508		1	314	14.8
	16										
	17										
Sample Total		152	116	0	268	100.0	383	91.6	200	293	20.5
13 - 19 May	2										
	3										
	4	23	22	0	45	10.0	138	22.9	45	219	9.1
	5	12	7	0	19	4.2	168	33.5	19	232	9.9
	6	11	12	0	23	5.1	216	49.2	23	249	13.0
	7	57	55	0	112	24.8	269	40.9	112	265	9.1
	8	30	39	0	69	15.3	304	45.2	69	275	10.4
	9	20	8	0	28	6.2	345	59.0	28	284	11.5
	10	30	14	0	44	9.7	379	57.7	44	292	11.8
	11	31	12	0	43	9.5	415	52.1	43	303	10.8
	12	29	17	0	46	10.2	420	61.9	46	304	10.1
	13	10	7	0	17	3.8	444	44.2	17	310	8.4
	14	3	3	0	6	1.3	478	79.3	6	316	7.8
	15										
	16										
	17										
Sample Total		256	196	0	452	100.0	308	103.9	452	273	28.6
20 - 26 May	2										
	3	1	3	0	4	1.3	123	10.9	4	206	3.1
	4	55	53	0	108	34.2	145	19.9	108	219	8.6
	5	11	7	0	18	5.7	173	23.1	18	230	7.8
	6	3	8	0	11	3.5	243	45.8	11	253	11.7
	7	35	28	0	63	19.9	262	35.4	63	259	10.3
	8	21	20	0	41	13.0	304	32.6	41	270	8.2
	9	8	7	0	15	4.7	337	53.9	15	281	12.7
	10	9	5	0	14	4.4	364	52.5	14	288	10.7
	11	9	6	0	15	4.7	411	58.1	15	293	12.5
	12	7	9	0	16	5.1	475	82.0	16	305	9.6
	13	6	3	0	9	2.8	467	65.0	9	308	5.7
	14	2	0	0	2	0.6	409	24.0	2	300	21.2
	15										
	16										
	17										
Sample Total		167	149	0	316	100.0	253	111.5	316	252	31.4

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Appendix B.15. (p. 2 of 2)

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
27 May - 2 June	2										
	3	6	9	0	15	3.5	110	16.9	15	200	10.5
	4	90	100	0	190	44.2	137	19.0	190	216	9.0
	5	14	9	0	23	5.3	186	45.0	23	236	15.3
	6	9	4	0	13	3.0	241	33.3	13	258	10.6
	7	29	49	0	78	18.1	245	38.2	78	259	12.2
	8	18	21	0	39	9.1	296	49.4	39	272	13.5
	9	7	7	0	14	3.3	311	59.8	14	277	12.8
	10	13	11	0	24	5.6	368	44.8	24	290	9.0
	11	11	0	0	11	2.6	396	37.3	11	298	8.4
	12	2	10	0	12	2.8	403	72.6	12	299	12.8
	13	2	7	0	9	2.1	413	50.3	9	305	12.5
	14	1	1	0	2	0.5	415	26.9	2	307	14.8
	15										
	16										
	17										
Sample Total		202	228	0	430	100.0	215	97.9	430	243	32.7
<hr/>											
3 - 9 June	2										
	3	1	4	0	5	4.4	123	44.8	5	197	10.8
	4	19	21	0	40	35.1	140	23.7	40	218	10.7
	5	1	2	0	3	2.6	164	38.6	3	232	9.9
	6	2	3	0	5	4.4	190	19.8	5	239	6.8
	7	20	14	0	34	29.8	262	28.1	34	261	8.4
	8	8	6	0	14	12.3	274	39.5	14	266	9.7
	9	2	3	0	5	4.4	358	42.3	5	283	8.0
	10	1	1	0	2	1.8	404	45.3	2	286	7.8
	11	2	1	0	3	2.6	409	62.8	3	291	10.5
	12	0	2	0	2	1.8	476	2.8	2	305	1.4
	13										
	14	0	1	0	1	0.9	538		1	312	
	15										
	16										
	17										
Sample Total		56	58	0	114	100.0	225	94.8	114	245	28.8
<hr/>											
All Weeks Combined 6 May - 9 June	2										
	3	8	16	0	24	1.5	115	24.1	24	201	9.8
	4	192	197	0	389	24.6	140	20.5	389	217	9.3
	5	40	25	0	65	4.1	175	36.0	65	233	11.8
	6	25	30	0	55	3.5	226	45.0	53	252	12.7
	7	157	162	0	319	20.2	263	39.9	312	262	10.8
	8	99	104	0	203	12.8	305	45.0	194	273	11.1
	9	48	30	0	78	4.9	344	59.6	76	283	11.6
	10	83	45	0	128	8.1	381	55.7	117	293	11.2
	11	77	33	0	110	7.0	415	54.9	101	300	10.8
	12	64	67	0	131	8.3	438	67.4	112	305	10.2
	13	32	28	0	60	3.8	444	57.4	54	307	9.4
	14	8	8	0	16	1.0	465	70.7	14	312	10.4
	15	0	2	0	2	0.1	508		1	314	14.8
	16										
	17										
All Samples Combined		833	747	0	1580	100.0	274	116.1	1512	262	34.4
<hr/>											
Sex Composition (%)		52.7	47.3								
<hr/>											
Not Aged		29	25	0	54	3.4	320	110.1	53	272	28.2
<hr/>											
Sex Composition (%)		53.7	46.3								

Appendix B.16. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches, Jacksmith Bay area, 1991.

Sample Week	Age	Sex (number)				Percent of Total	Weight		Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD
	2										
	3	16	27	0	43	12.4	101	42.2	43	197	19.2
	4	64	63	0	127	36.7	130	26.2	127	216	11.8
	5	20	18	0	38	11.0	175	40.9	38	233	15.3
	6	13	13	0	26	7.5	205	54.6	26	245	21.0
	7	30	31	0	61	17.6	234	58.1	61	255	18.1
	8	12	13	0	25	7.2	260	53.7	25	262	16.1
20 - 26 May	9	4	6	0	10	2.9	276	78.7	10	266	25.3
	10	2	4	0	6	1.7	372	42.3	6	295	13.2
	11	2	3	0	5	1.4	348	107.5	5	283	22.3
	12	1	3	0	4	1.2	388	40.6	4	295	9.2
	13	0	1	0	1	0.3	378		1	312	1
	14										
	15										
	16										
	17										
All Samples Combined		164	182	0	346	100.0	180	81.5	346	233	29.7
Sex Composition (%)		47.4	52.6								346
Not Aged		8	11	0	19	5.5	301	123.4	19	271	32.8
Sex Composition (%)		42.1	57.9								19

Appendix B.17. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches,
Cape Avinof District, 1991.

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
20 - 26 May	2											
	3	0	1	0	1	0.4	98		1	197		1
	4	22	17	0	39	13.9	142	29.8	39	222	14.1	39
	5	12	4	0	16	5.7	185	23.4	16	239	8.2	16
	6	8	5	0	13	4.6	224	39.4	13	246	11.9	13
	7	40	22	0	62	22.1	252	42.1	62	259	12.5	62
	8	20	26	0	46	16.4	289	41.1	46	268	11.8	46
	9	17	10	0	27	9.6	331	51.5	27	278	12.7	27
	10	14	16	0	30	10.7	379	68.0	30	292	13.1	30
	11	13	9	0	22	7.8	406	70.8	22	298	15.2	22
	12	12	6	0	18	6.4	394	68.5	18	291	14.7	18
	13	6	1	0	7	2.5	427	47.5	7	301	5.2	7
	14											
	15											
	16											
	17											
Sample Total		164	117	0	281	100.0	284	99.1	281	265	27.6	281
27 May - 2 June	2											
	3	1	1	0	2	1.3	102	14.1	2	202	11.3	2
	4	6	10	0	16	10.2	138	31.7	16	217	13.3	16
	5	5	16	0	21	13.4	168	30.1	21	231	12.3	21
	6	1	8	0	9	5.7	215	53.4	9	243	17.1	9
	7	12	18	0	30	19.1	254	49.8	30	257	11.2	30
	8	11	13	0	24	15.3	290	41.1	24	270	10.6	24
	9	8	9	0	17	10.8	308	41.9	17	277	9.4	17
	10	2	3	0	5	3.2	398	44.2	5	294	15.6	5
	11	6	8	0	14	8.9	432	54.7	14	306	8.7	14
	12	2	7	0	9	5.7	461	45.0	9	304	4.9	9
	13	0	9	0	9	5.7	435	44.1	9	303	10.1	9
	14	1	0	0	1	0.6	456		1	312		1
	15											
	16											
	17											
Sample Total		55	102	0	157	100.0	282	111.2	157	263	31.3	157
3 - 9 June	2											
	3	18	21	0	39	10.7	91	14.6	39	191	20.6	39
	4	37	49	0	86	23.7	127	24.7	86	213	24.6	86
	5	28	32	0	60	16.5	162	31.1	60	229	16.7	60
	6	8	9	0	17	4.7	195	30.7	17	244	9.2	17
	7	23	30	0	53	14.6	227	34.8	53	256	14.1	53
	8	20	21	0	41	11.3	258	42.2	41	268	8.7	41
	9	12	17	0	29	8.0	282	53.3	29	273	10.9	29
	10	9	3	0	12	3.3	300	60.0	12	279	9.5	12
	11	1	4	0	5	1.4	405	73.7	5	301	10.9	5
	12	10	7	0	17	4.7	367	72.0	17	297	7.7	17
	13	2	0	0	2	0.6	413	41.0	2	307	11.3	2
	14	1	0	0	1	0.3	416		1	305		1
	15	1	0	0	1	0.3	458		1	306		1
	16											
	17											
Sample Total		170	193	0	363	100.0	198	89.1	363	240	35.6	363

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Appendix B.17. (p. 2 of 2)

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3	13	19	0	32	11.0	94	17.6	32	195	10.3	32
	4	48	42	0	90	30.8	121	23.8	90	213	10.4	90
	5	29	35	0	64	21.9	160	26.7	64	231	9.6	64
	6	6	14	0	20	6.8	185	33.9	20	241	11.5	20
	7	10	22	0	32	11.0	235	38.4	32	258	12.6	32
	8	4	10	0	14	4.8	256	31.3	14	264	17.8	14
10 - 16 June	9	10	14	0	24	8.2	293	54.8	24	271	14.2	24
	10	0	5	0	5	1.7	300	81.8	5	279	10.4	5
	11	1	4	0	5	1.7	429	63.8	5	299	3.5	5
	12	0	4	0	4	1.4	420	55.8	4	301	12.2	4
	13	1	1	0	2	0.7	389	24.0	2	306	5.7	2
	14											
	15											
	16											
	17											
	Sample Total	122	170	0	292	100.0	178	84.2	292	233	29.4	292
	2											
	3	32	42	0	74	6.8	93	15.8	74	193	16.6	74
	4	113	118	0	231	21.1	128	26.7	231	215	17.9	231
	5	74	87	0	161	14.7	164	29.3	161	231	13.1	161
	6	23	36	0	59	5.4	201	39.9	59	243	11.9	59
	7	85	92	0	177	16.2	242	42.2	177	258	12.8	177
All Weeks Combined	8	55	70	0	125	11.4	275	43.1	125	268	11.5	125
20 May - 16 June	9	47	50	0	97	8.9	303	54.2	97	275	12.2	97
	10	25	27	0	52	4.8	355	74.8	52	288	13.6	52
	11	21	25	0	46	4.2	416	64.9	46	301	12.4	46
	12	24	24	0	48	4.4	399	71.8	48	296	11.5	48
	13	9	11	0	20	1.8	425	43.0	20	303	8.0	20
	14	2	0	0	2	0.2	436	28.3	2	309	4.9	2
	15	1	0	0	1	0.1	458		1	306		1
	16											
	17											
All Samples Combined		511	582	0	1093	100.0	227	104.8	1093	248	34.2	1093
Sex Composition (%)		46.8	53.2									
Not Aged		18	28	0	46	4.2	257	107.1	46	256	27.2	46
Sex Composition (%)		39.1	60.9									

Appendix B.18. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches, Kwigillingok area, Cape Avinof District, 1991.

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
27 May - 2 June	2											
	3	1	6	0	7	2.8	105	15.7	7	200	9.1	7
	4	22	43	0	65	25.8	126	18.3	65	212	10.6	65
	5	16	32	0	48	19.0	165	25.8	48	229	11.8	48
	6	4	16	0	20	7.9	198	27.7	20	243	11.4	20
	7	23	32	0	55	21.8	238	42.0	55	254	10.0	55
	8	10	10	0	20	7.9	264	56.9	20	264	13.6	20
	9	4	6	0	10	4.0	290	53.5	10	267	15.5	10
	10	3	8	0	11	4.4	370	72.2	11	287	17.4	11
	11	2	4	0	6	2.4	426	83.7	6	302	11.8	6
	12	1	5	0	6	2.4	368	43.6	6	288	8.5	6
	13	1	1	0	2	0.8	393	32.5	2	302	7.8	2
	14	0	2	0	2	0.8	462	135.8	2	302	31.8	2
	15											
	16											
	17											
Sample Total		87	165	0	252	100.0	209	90.8	252	241	28.7	252
3 - 9 June	2											
	3	13	24	0	37	14.6	88	9.9	37	193	7.5	37
	4	30	61	0	91	36.0	126	37.4	91	213	15.2	91
	5	24	29	0	53	20.9	164	39.3	53	233	15.4	53
	6	7	9	0	16	6.3	205	72.0	16	244	22.7	16
	7	13	13	0	26	10.3	222	54.4	26	255	15.1	26
	8	5	5	0	10	4.0	227	69.5	10	254	25.8	10
	9	2	6	0	8	3.2	288	81.0	8	268	21.1	8
	10	1	1	0	2	0.8	330	31.1	2	287	1.4	2
	11	1	1	0	2	0.8	314	31.1	2	285	7.8	2
	12	4	1	0	5	2.0	357	26.4	5	294	5.3	5
	13	1	2	0	3	1.2	400	67.6	3	300	9.3	3
	14											
	15											
	16											
	17											
Sample Total		101	152	0	253	100.0	163	78.3	253	228	29.4	253
10 - 16 June	2											
	3	10	24	0	34	44.7	84	15.6	34	192	11.3	34
	4	10	13	0	23	30.3	109	25.4	23	210	13.3	23
	5	1	8	0	9	11.8	135	26.3	9	224	14.9	9
	6											
	7	0	4	0	4	5.3	224	31.6	4	256	7.9	4
	8	1	1	0	2	2.6	250	25.5	2	282	4.2	2
	9	0	1	0	1	1.3	370		1	302		1
	10											
	11	2	0	0	2	2.6	278	33.9	2	293	18.4	2
	12	1	0	0	1	1.3	256		1	278		1
	13											
	14											
	15											
	16											
	17											
Sample Total		25	51	0	76	100.0	121	62.0	76	212	30.2	76

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Appendix B.18. (p. 2 of 2)

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3	24	54	0	78	13.4	88	14.3	78	193	9.6	78
	4	62	117	0	179	30.8	124	30.7	179	212	13.4	179
	5	41	69	0	110	18.9	162	33.8	110	230	14.0	110
	6	11	25	0	36	6.2	201	51.5	36	244	17.1	36
	7	36	49	0	85	14.6	233	45.9	85	254	11.6	85
All Weeks Combined	8	16	16	0	32	5.5	252	60.8	32	262	18.9	32
27 May - 16 June	9	6	13	0	19	3.3	293	65.8	19	269	18.8	19
	10	4	9	0	13	2.2	364	68.2	13	287	15.9	13
	11	5	5	0	10	1.7	374	93.5	10	297	13.2	10
	12	6	6	0	12	2.1	354	45.9	12	290	8.0	12
	13	2	3	0	5	0.9	397	50.6	5	301	7.7	5
	14	0	2	0	2	0.3	462	135.8	2	302	31.8	2
	15											
	16											
	17											
All Samples Combined		213	368	0	581	100.0	177	87.6	581	232	30.8	581
Sex Composition (%)		36.7	63.3									
Not Aged		13	22	0	35	6.0	267	125.4	35	258	36.0	35
Sex Composition (%)		37.1	62.9									

Appendix B.19. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches,
Nelson Island District, 1991.

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length			
		Male	Female	Unknown		Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6											
13 - 19 May	7	2	4	0	6	35.3	279	47.9	6	267	10.5	6
	8	0	4	0	4	23.5	308	34.3	4	271	7.3	4
	9	1	1	0	2	11.8	403	18.4	2	293	2.8	2
	10	2	3	0	5	29.4	358	21.9	5	290	5.6	5
	11											
	12											
	13											
	14											
	15											
	16											
	17											
Sample Total		5	12	0	17	100.0	324	55.3	17	278	13.5	17
<hr/>												
20 - 26 May	2											
	3	3	0	0	3	0.6	104	20.8	3	198	8.0	3
	4	21	26	0	47	9.5	132	33.4	47	209	30.7	47
	5	9	15	0	24	4.8	186	45.1	24	235	11.7	24
	6	17	4	0	21	4.2	235	42.0	21	251	28.2	21
	7	57	48	0	105	21.2	281	51.0	105	269	10.6	105
	8	47	46	0	93	18.8	311	54.9	93	277	9.9	93
	9	12	8	0	20	4.0	343	59.1	20	284	10.6	20
	10	17	24	0	41	8.3	389	60.0	41	294	10.9	41
	11	20	19	0	39	7.9	416	53.9	39	301	23.1	39
	12	33	24	0	57	11.5	439	65.2	57	304	17.0	57
	13	13	21	0	34	6.9	455	80.9	34	303	21.7	34
	14	4	6	0	10	2.0	482	97.4	10	315	14.6	10
	15	1	0	0	1	0.2	484		1	305		1
	16											
	17											
Sample Total		254	241	0	495	100.0	322	113.5	495	274	33.5	495
<hr/>												
27 May - 2 June	2											
	3	1	2	0	3	0.9	97	15.5	3	199	7.8	3
	4	25	15	0	40	12.0	129	33.5	40	215	10.3	40
	5	7	2	0	9	2.7	141	21.3	9	224	9.9	9
	6	4	5	0	9	2.7	230	63.3	9	256	21.8	9
	7	33	35	0	68	20.4	258	43.2	68	265	10.6	68
	8	32	23	0	55	16.5	319	59.2	55	278	12.6	55
	9	12	14	0	26	7.8	356	67.5	26	287	11.8	26
	10	21	15	0	36	10.8	378	66.4	36	294	12.3	36
	11	16	9	0	25	7.5	398	64.2	25	293	24.8	25
	12	18	14	0	32	9.6	427	59.5	32	301	18.6	32
	13	8	10	0	18	5.4	435	46.8	18	306	7.9	18
	14	5	7	0	12	3.6	460	40.4	12	310	8.5	12
	15											
	16											
	17											
Sample Total		182	151	0	333	100.0	311	113.4	333	273	31.8	333

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Appendix B.19. (p. 2 of 2)

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
3 - 9 June	2										
	3	1	1	0	2	0.7	111	1.4	2	208	2.1
	4	35	16	0	51	17.7	123	14.6	51	214	16.0
	5	11	6	0	17	5.9	165	37.1	17	234	11.5
	6	3	2	0	5	1.7	220	87.7	5	248	28.2
	7	32	26	0	58	20.1	244	49.3	58	262	15.6
	8	11	15	0	26	9.0	297	61.1	26	275	13.3
	9	9	6	0	15	5.2	345	65.7	15	282	19.9
	10	23	10	0	33	11.5	364	52.0	33	295	11.4
	11	18	11	0	29	10.1	400	57.0	29	299	9.4
	12	19	12	0	31	10.8	389	62.3	31	298	15.2
	13	11	7	0	18	6.3	437	72.8	18	311	10.9
	14	0	3	0	3	1.0	420	73.4	3	307	10.5
	15										
	16										
	17										
Sample Total		173	115	0	288	100.0	286	117.7	288	268	35.5
<hr/>											
10 - 16 June	2										
	3	9	3	0	12	10.9	82	13.1	12	188	9.7
	4	16	10	0	26	23.6	118	28.5	26	213	8.3
	5	2	1	0	3	2.7	131	16.2	3	226	7.0
	6	1	1	0	2	1.8	200	33.9	2	250	0.0
	7	12	8	0	20	18.2	240	48.5	20	265	17.2
	8	10	3	0	13	11.8	262	46.7	13	267	21.2
	9	5	4	0	9	8.2	306	34.2	9	279	8.9
	10	5	2	0	7	6.4	307	61.7	7	290	8.1
	11	4	0	0	4	3.6	352	39.1	4	295	11.1
	12	4	3	0	7	6.4	341	81.9	7	304	11.6
	13	4	1	0	5	4.5	365	39.9	5	298	6.7
	14	0	2	0	2	1.8	423	55.2	2	311	4.9
	15										
	16										
	17										
Sample Total		72	38	0	110	100.0	222	105.5	110	252	39.8
<hr/>											
17 - 23 June	2										
	3	6	5	0	11	20.4	83	14.0	11	193	10.0
	4	14	14	0	28	51.9	106	19.8	28	209	16.8
	5	1	0	0	1	1.9	164		1	238	1
	6										
	7	1	1	0	2	3.7	211	1.4	2	259	3.5
	8	1	4	0	5	9.3	262	30.6	5	270	5.5
	9	0	2	0	2	3.7	375	55.2	2	294	19.8
	10	2	1	0	3	5.6	312	75.4	3	296	9.2
	11	0	2	0	2	3.7	335	24.0	2	296	2.1
	12										
	13										
	14										
	15										
	16										
	17										
Sample Total		25	29	0	54	100.0	151	92.4	54	225	37.6
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Appendix B.19. (p. 3 of 3)

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3	20	11	0	31	2.4	88	16.3	31	193	10.3	31
All Weeks Combined	4	111	81	0	192	14.8	123	28.1	192	212	19.2	192
13 May - 23 June	5	30	24	0	54	4.2	168	41.7	54	232	11.6	54
	6	25	12	0	37	2.9	230	53.3	37	252	25.4	37
	7	137	122	0	259	20.0	263	50.8	259	266	12.6	259
	8	101	95	0	196	15.1	307	57.4	196	276	12.3	196
	9	39	35	0	74	5.7	346	61.8	74	285	13.4	74
	10	70	55	0	125	9.6	372	62.0	125	294	11.1	125
	11	58	41	0	99	7.6	403	58.3	99	298	19.9	99
	12	74	53	0	127	9.8	418	69.0	127	302	16.7	127
	13	36	39	0	75	5.8	440	72.3	75	306	16.3	75
	14	9	18	0	27	2.1	461	70.5	27	311	11.0	27
	15	1	0	0	1	0.1	484		1	305		1
	16											
	17											
All Samples Combined		711	586	0	1297	100.0	295	119.5	1297	269	35.8	1297
	Sex Composition (%)	54.8	45.2									
Not Aged		14	15	0	29	2.2	304	100.6	29	279	36.6	29
	Sex Composition (%)	48.3	51.7									

Appendix B.20. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches,
Nunivak Island District, 1991.

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
13 - 19 May	2										
	3										
	4										
	5										
	6										
	7	1	0	0	1	2.3	308	1	270	1	
	8	3	0	0	3	7.0	337	3	285	0.0	3
	9	1	1	0	2	4.7	355	2	298	3.5	2
	10	10	3	0	13	30.2	409	13	295	11.3	13
	11	3	3	0	6	14.0	406	6	293	10.4	6
	12	8	2	0	10	23.3	411	10	302	9.4	10
	13	3	1	0	4	9.3	432	4	308	6.5	4
	14	1	2	0	3	7.0	471	3	307	15.3	3
	15	0	1	0	1	2.3	450	1	315		1
	16										
	17										
Sample Total		30	13	0	43	100.0	406	52.5	43	297	12.0
											43
20 - 26 May	2										
	3										
	4	1	0	0	1	0.3	150	1	233	1	
	5										
	6	1	0	0	1	0.3	200	1	255	1	
	7	13	9	0	22	6.9	282	22	267	8.3	22
	8	33	14	0	47	14.6	308	47	276	9.9	47
	9	26	13	0	39	12.1	335	39	283	11.4	39
	10	33	14	0	47	14.6	353	47	290	9.5	47
	11	29	14	0	43	13.4	372	43	295	10.7	43
	12	41	32	0	73	22.7	392	73	300	11.7	73
	13	20	15	0	35	10.9	397	35	299	11.8	35
	14	8	5	0	13	4.0	449	13	309	10.9	13
	15										
	16										
	17										
Sample Total		205	116	0	321	100.0	358	67.5	321	290	15.6
											321
27 May - 2 June	2										
	3										
	4	5	4	0	9	50.0	139	9	221	5.9	9
	5	0	1	0	1	5.6	132	1	225		1
	6										
	7	0	1	0	1	5.6	238	1	263	1	
	8	1	2	0	3	16.7	301	3	275	2.1	3
	9										
	10	1	0	0	1	5.6	352	1	283	1	
	11	1	1	0	2	11.1	404	2	296	10.6	2
	12	1	0	0	1	5.6	370	1	308		1
	13										
	14										
	15										
	16										
	17										
Sample Total		9	9	0	18	100.0	225	108.2	18	249	33.5
											18

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Appendix B.20. (p. 2 of 2)

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4	19	20	0	39	31.0	128	21.7	39	216	6.7	39
	5	4	3	0	7	5.6	140	22.6	7	223	6.2	7
	6	3	1	0	4	3.2	172	39.3	4	235	16.7	4
	7	5	6	0	11	8.7	255	51.3	11	261	12.8	11
	8	10	2	0	12	9.5	248	42.4	12	265	16.3	12
3 - 9 June	9	0	3	0	3	2.4	279	65.2	3	270	13.6	3
	10	6	8	0	14	11.1	376	45.1	14	292	7.9	14
	11	5	4	0	9	7.1	414	23.2	9	302	3.2	9
	12	7	5	0	12	9.5	412	78.9	12	303	8.8	12
	13	9	4	0	13	10.3	421	63.3	13	306	9.0	13
	14	1	1	0	2	1.6	420	53.7	2	296	7.8	2
	15											
	16											
	17											
	Sample Total	69	57	0	126	100.0	266	129.9	126	261	38.0	126
	2											
	3											
	4	25	24	0	49	9.6	130	21.4	49	218	7.1	49
	5	4	4	0	8	1.6	139	21.1	8	223	5.8	8
	6	4	1	0	5	1.0	178	36.3	5	239	16.9	5
	7	19	16	0	35	6.9	273	44.5	35	265	9.9	35
All Weeks Combined	8	47	18	0	65	12.8	298	49.4	65	274	11.9	65
13 May - 9 June	9	27	17	0	44	8.7	332	50.0	44	283	12.1	44
	10	50	25	0	75	14.8	367	50.0	75	291	9.6	75
	11	38	22	0	60	11.8	383	46.2	60	296	10.1	60
	12	57	39	0	96	18.9	397	59.3	96	300	11.1	96
	13	32	20	0	52	10.2	406	63.9	52	301	11.4	52
	14	10	8	0	18	3.5	450	70.6	18	307	11.5	18
	15	0	1	0	1	0.2	450		1	315		1
	16											
	17											
All Samples Combined		313	195	0	508	100.0	335	100.3	508	282	27.8	508
Sex Composition (%)		61.6	38.4									
Not Aged		43	28	0	71	14.0	362	92.5	71	288	26.7	71
Sex Composition (%)		60.6	39.4									

Appendix B.21. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches, Kokechik Bay area, Cape Romanzof District, 1991.

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
13 - 19 May	2										
	3										
	4										
	5	3	4	0	7	2.1	205	25.6	7	245	9.6
	6	4	5	0	9	2.7	265	45.2	9	258	7.5
	7	48	36	0	84	24.9	285	40.3	84	267	10.6
	8	28	18	0	46	13.6	318	44.4	45	277	19.1
	9	26	37	0	63	18.6	358	57.7	63	286	21.2
	10	23	25	0	48	14.2	384	60.3	48	287	12.1
	11	24	11	0	35	10.4	402	57.4	35	294	12.2
	12	17	16	0	33	9.8	418	67.3	33	299	13.5
	13	8	5	0	13	3.8	402	52.8	13	297	9.3
	14										
	15										
	16										
	17										
Sample Total		181	157	0	338	100.0	345	74.2	337	281	19.5
											338
20 - 26 May	2										
	3										
	4	2	6	1	9	1.7	173	103.4	9	236	27.0
	5	9	5	0	14	2.7	199	39.3	14	241	7.7
	6	7	8	0	15	2.9	248	39.1	15	255	10.0
	7	85	87	0	172	32.7	276	42.0	172	263	9.8
	8	44	32	0	76	14.4	317	51.8	76	273	12.2
	9	42	34	0	76	14.4	352	43.9	76	282	16.7
	10	39	34	0	73	13.9	373	45.4	73	285	11.0
	11	18	16	0	34	6.5	386	46.0	34	290	9.5
	12	19	8	0	27	5.1	412	60.5	27	293	21.2
	13	9	14	0	23	4.4	431	64.2	23	299	10.8
	14	1	4	0	5	1.0	481	68.0	5	304	10.6
	15	1	1	0	2	0.4	522	90.5	2	305	19.8
	16										
	17										
Sample Total		276	249	1	526	100.0	325	77.4	526	274	19.2
											526
27 May - 2 June	2										
	3										
	4	3	0	0	3	2.5	131	7.0	3	224	5.1
	5	5	4	0	9	7.6	168	19.0	9	238	7.1
	6	4	2	0	6	5.1	204	47.1	6	251	10.4
	7	13	14	0	27	22.9	259	33.3	27	266	7.5
	8	8	6	0	14	11.9	293	45.9	14	275	12.1
	9	6	13	0	19	16.1	329	29.9	19	283	8.2
	10	11	4	0	15	12.7	342	38.2	15	288	8.7
	11	5	5	0	10	8.5	381	55.4	10	294	12.5
	12	6	3	0	9	7.6	374	46.8	9	298	11.8
	13	2	3	0	5	4.2	387	37.5	5	298	4.4
	14										
	15										
	16	1	0	0	1	0.8	416		1	310	1
	17										
Sample Total		64	54	0	118	100.0	298	77.7	118	275	20.9
											118

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Appendix B.21. (p. 2 of 2)

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4	5	6	1	12	1.2	163	90.2	12	233	23.8	12
	5	17	13	0	30	3.1	191	34.0	30	241	8.1	30
	6	15	15	0	30	3.1	244	46.5	30	255	9.4	30
	7	146	137	0	283	28.8	277	41.2	283	264	10.1	283
All Weeks Combined	8	80	56	0	136	13.8	315	49.1	135	274	14.9	136
13 May - 2 June	9	74	84	0	158	16.1	352	49.2	158	284	17.9	158
	10	73	63	0	136	13.8	373	51.6	136	286	11.2	136
	11	47	32	0	79	8.0	392	52.5	79	293	11.2	79
	12	42	27	0	69	7.0	410	63.2	69	296	16.8	69
	13	19	22	0	41	4.2	416	59.5	41	298	9.7	41
	14	1	4	0	5	0.5	481	68.0	5	304	10.6	5
	15	1	1	0	2	0.2	522	90.5	2	305	19.8	2
	16	1	0	0	1	0.1	416		1	310		1
	17											
All Samples Combined		521	460	1	982	100.0	329	77.6	981	277	19.8	982
Sex Composition (%)		53.1	46.9									
Not Aged		46	34	0	80	8.1	339	80.9	80	280	17.9	80
Sex Composition (%)		57.5	42.5									

Appendix B.22. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches, Scammon Bay area, Cape Romanzof District, 1991.

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
27 May - 2 June	2										
	3										
	4	6	4	0	10	8.2	140	21.5	10	220	10.0
	5	5	4	0	9	7.4	164	29.2	9	230	8.1
	6	1	2	0	3	2.5	187	34.3	3	243	7.5
	7	25	22	0	47	38.5	258	38.2	47	263	8.9
	8	9	12	0	21	17.2	305	50.7	21	273	9.1
	9	6	5	0	11	9.0	333	58.9	11	281	7.8
	10	7	7	0	14	11.5	336	50.2	14	267	54.6
	11	1	1	0	2	1.6	444	135.8	2	300	9.2
	12	2	1	0	3	2.5	408	14.0	3	304	3.8
	13	1	1	0	2	1.6	471	108.9	2	312	17.0
	14										
	15										
	16										
	17										
Sample Total		63	59	0	122	100.0	274	84.1	122	263	27.9
3 - 9 June	2										
	3	0	1	0	1	2.1	104		1	194	1
	4	6	6	0	12	25.5	131	11.2	12	214	7.0
	5	4	2	0	6	12.8	160	12.3	6	228	5.8
	6	1	1	0	2	4.3	171	7.1	2	246	14.1
	7	4	4	0	8	17.0	241	21.6	8	262	6.6
	8	3	0	0	3	6.4	285	34.4	3	280	9.0
	9	3	1	0	4	8.5	299	26.1	4	282	6.4
	10	0	4	0	4	8.5	280	48.2	4	290	11.2
	11	3	0	0	3	6.4	325	57.4	3	295	12.6
	12	0	1	0	1	2.1	340		1	294	1
	13	2	1	0	3	6.4	374	53.8	3	303	7.6
	14										
	15										
	16										
	17										
Sample Total		26	21	0	47	100.0	224	85.6	47	254	34.3
All Weeks Combined 27 May - 9 June	2										
	3	0	1	0	1	0.6	104		1	194	1
	4	12	10	0	22	13.0	135	16.9	22	217	8.9
	5	9	6	0	15	8.9	162	23.3	15	229	7.1
	6	2	3	0	5	3.0	180	26.0	5	244	9.0
	7	29	26	0	55	32.5	256	36.6	55	263	8.6
	8	12	12	0	24	14.2	303	48.8	24	274	9.1
	9	9	6	0	15	8.9	324	53.6	15	282	7.2
	10	7	11	0	18	10.7	324	54.0	18	272	49.0
	11	4	1	0	5	3.0	373	102.4	5	297	10.3
	12	2	2	0	4	2.4	391	35.9	4	301	5.7
	13	3	2	0	5	3.0	413	85.0	5	307	11.1
	14										
	15										
	16										
	17										
All Samples Combined Sex Composition (%)		89	80	0	169	100.0	260	87.2	169	260	30.0
		52.7	47.3								
Not Aged Sex Composition (%)		9	7	0	16	9.5	267	93.0	16	264	27.5
		56.3	43.8								

Appendix B.23 Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches,
Kokechik Bay\Scammon Bay areas combined, Cape Romanzof District, 1991.

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
13 - 19 May	2										
	3										
	4										
	5	3	4	0	7	2.1	205	25.6	7	245	9.6
	6	4	5	0	9	2.7	265	45.2	9	258	7.5
	7	48	36	0	84	24.9	285	40.3	84	267	10.6
	8	28	18	0	46	13.6	318	44.4	45	277	19.1
	9	26	37	0	63	18.6	358	57.7	63	286	21.2
	10	23	25	0	48	14.2	384	60.3	48	287	12.1
	11	24	11	0	35	10.4	402	57.4	35	294	12.2
	12	17	16	0	33	9.8	418	67.3	33	299	13.5
	13	8	5	0	13	3.8	402	52.8	13	297	9.3
	14										
	15										
	16										
	17										
Sample Total		181	157	0	338	100.0	345	74.2	337	281	19.5
20 - 26 May	2										
	3										
	4	2	6	1	9	1.7	173	103.4	9	236	27.0
	5	9	5	0	14	2.7	199	39.3	14	241	7.7
	6	7	8	0	15	2.9	248	39.1	15	255	10.0
	7	85	87	0	172	32.7	276	42.0	172	263	9.8
	8	44	32	0	76	14.4	317	51.8	76	273	12.2
	9	42	34	0	76	14.4	352	43.9	76	282	16.7
	10	39	34	0	73	13.9	373	45.4	73	285	11.0
	11	18	16	0	34	6.5	386	46.0	34	290	9.5
	12	19	8	0	27	5.1	412	60.5	27	293	21.2
	13	9	14	0	23	4.4	431	64.2	23	299	10.8
	14	1	4	0	5	1.0	481	68.0	5	304	10.6
	15	1	1	0	2	0.4	522	90.5	2	305	19.8
	16										
	17										
Sample Total		276	249	1	526	100.0	325	77.4	526	274	19.2
27 May - 2 June	2										
	3										
	4	9	4	0	13	5.4	138	19.3	13	221	9.1
	5	10	8	0	18	7.5	166	24.0	18	234	8.5
	6	5	4	0	9	3.7	198	41.9	9	248	9.9
	7	39	36	0	75	31.1	259	36.0	75	264	8.4
	8	17	18	0	35	14.5	300	48.5	35	274	10.2
	9	12	18	0	30	12.4	330	41.9	30	282	8.0
	10	18	11	0	29	12.0	339	43.7	29	278	39.3
	11	6	6	0	12	5.0	391	69.2	12	295	11.8
	12	8	4	0	12	5.0	382	43.3	12	299	10.5
	13	3	4	0	7	2.9	411	67.8	7	302	10.4
	14										
	15										
	16	1	0	0	1	0.4	416		1	310	1
	17										
Sample Total		128	113	0	241	100.0	285	81.6	241	269	25.4

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Appendix B.23. (p. 2 of 2)

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
3 - 9 June	2											
	3	0	1	0	1	2.1	104		1	194		1
	4	6	6	0	12	25.5	131	11.2	12	214	7.0	12
	5	4	2	0	6	12.8	160	12.3	6	228	5.8	6
	6	1	1	0	2	4.3	171	7.1	2	246	14.1	2
	7	4	4	0	8	17.0	241	21.6	8	262	6.6	8
	8	3	0	0	3	6.4	285	34.4	3	280	9.0	3
	9	3	1	0	4	8.5	299	26.1	4	282	6.4	4
	10	0	4	0	4	8.5	280	48.2	4	290	11.2	4
	11	3	0	0	3	6.4	325	57.4	3	295	12.6	3
	12	0	1	0	1	2.1	340		1	294		1
	13	2	1	0	3	6.4	374	53.8	3	303	7.6	3
	14											
	15											
	16											
	17											
Sample Total		26	21	0	47	100.0	224	85.6	47	254	34.3	47
All Weeks Combined 13 May - 9 June	2											
	3	0	1	0	1	0.1	104		1	194		1
	4	17	16	1	34	3.0	145	55.4	34	223	17.4	34
	5	26	19	0	45	3.9	181	33.5	45	237	9.6	45
	6	17	18	0	35	3.0	235	49.4	35	253	10.0	35
	7	176	163	0	339	29.4	274	41.2	339	264	9.8	339
	8	92	68	0	160	13.9	313	49.1	159	274	14.1	160
	9	83	90	0	173	15.0	349	50.0	173	284	17.3	173
	10	80	74	0	154	13.4	368	54.1	154	285	20.0	154
	11	51	33	0	84	7.3	391	55.8	84	293	11.1	84
	12	44	29	0	73	6.3	409	62.0	73	297	16.4	73
	13	22	24	0	46	4.0	416	61.6	46	299	10.0	46
	14	1	4	0	5	0.4	481	68.0	5	304	10.6	5
	15	1	1	0	2	0.2	522	90.5	2	305	19.8	2
	16	1	0	0	1	0.1	416		1	310		1
	17											
All Samples Combined Sex Composition (%)		611	540	1	1152	100.0	319	82.7	1151	274	22.3	1152
Not Aged Sex Composition (%)		55	41	0	96	8.3	327	86.8	96	278	20.6	96

Appendix B.24. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches,
St Michael Subdistrict, Norton Sound District, 1991.

Sample Week	Age	Sex (number)				Percent of Total	Weight		Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD
20 - 26 May	2										
	3										
	4										
	5	0	1	0	1	0.8	180		1	238	1
	6	1	1	0	2	1.6	327	21.2	2	266	0.7
	7	5	9	0	14	11.5	259	39.8	14	263	7.8
	8	4	6	0	10	8.2	304	32.4	10	277	6.6
	9	20	15	0	35	28.7	337	39.4	35	279	9.4
	10	22	12	0	34	27.9	347	43.9	34	284	7.2
	11	9	6	0	15	12.3	375	32.7	15	291	9.0
	12	6	2	0	8	6.6	348	42.4	8	287	5.6
	13	0	2	0	2	1.6	410	50.9	2	301	6.4
	14										
	15										
	16										
	17	1	0	0	1	0.8	324		1	288	1
	Sample Total	68	54	0	122	100.0	333	52.4	122	280	12.0
27 May - 2 June	2										
	3										
	4										
	5	3	2	0	5	2.4	184	22.8	5	237	8.8
	6	5	2	0	7	3.4	213	16.8	7	248	6.3
	7	14	14	0	28	13.5	267	38.1	27	262	10.0
	8	17	12	0	29	13.9	322	40.9	28	274	6.8
	9	38	25	0	63	30.3	351	43.3	60	281	9.3
	10	25	16	0	41	19.7	361	38.6	41	286	7.9
	11	6	10	0	16	7.7	395	41.0	16	293	7.8
	12	12	5	0	17	8.2	384	41.6	17	293	12.1
	13	1	1	0	2	1.0	352	19.8	2	290	4.9
	14										
	15										
	16										
	17										
	Sample Total	121	87	0	208	100.0	335	62.9	203	278	15.4
3 - 9 June	2										
	3	2	3	0	5	1.4	101	12.1	5	198	7.4
	4	19	10	0	29	8.0	122	16.1	29	215	7.0
	5	31	44	0	75	20.7	160	23.2	75	232	8.5
	6	12	6	0	18	5.0	184	24.5	18	243	10.1
	7	21	15	0	36	9.9	260	37.5	36	263	9.5
	8	26	11	0	37	10.2	294	30.6	37	273	7.4
	9	41	38	0	79	21.8	320	38.2	79	279	7.8
	10	31	20	0	51	14.1	334	46.0	51	285	9.0
	11	10	8	0	18	5.0	356	40.8	18	291	9.8
	12	6	6	0	12	3.3	362	41.2	12	293	7.4
	13	1	1	0	2	0.6	388	67.2	2	298	8.5
	14										
	15										
	16										
	17										
	Sample Total	200	162	0	362	100.0	258	89.4	362	261	27.2

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Appendix B.24. (p. 2 of 2)

Sample	Week	Age	Sex (number)			Percent of Total	Weight		Length		
			Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD
		2									
		3									
		4	2	4	0	6	12.0	119	10.2	6	210
		5	9	11	0	20	40.0	145	20.0	20	225
		6	3	3	0	6	12.0	182	28.1	6	246
		7	1	7	0	8	16.0	218	41.7	8	259
		8	1	4	0	5	10.0	268	7.7	5	272
10 - 16 June		9	1	1	0	2	4.0	281	35.4	2	273
		10	0	1	0	1	2.0	334		1	288
		11	1	1	0	2	4.0	345	49.5	2	295
		12									
		13									
		14									
		15									
		16									
		17									
	Sample Total		18	32	0	50	100.0	187	67.2	50	242
											26.6
											50
		2									
		3	2	3	0	5	0.7	101	12.1	5	198
		4	21	14	0	35	4.7	122	15.2	35	214
		5	43	58	0	101	13.6	158	23.9	101	231
		6	21	12	0	33	4.4	198	42.0	33	246
		7	41	45	0	86	11.6	258	40.1	85	263
All Weeks Combined		8	48	33	0	81	10.9	304	37.0	80	274
20 May - 16 June		9	100	79	0	179	24.1	333	42.6	176	280
		10	78	49	0	127	17.1	346	44.0	127	285
		11	26	25	0	51	6.9	373	41.4	51	292
		12	24	13	0	37	5.0	369	43.1	37	292
		13	2	4	0	6	0.8	383	46.7	6	296
		14									
		15									
		16									
		17	1	0	0	1	0.1	324		1	288
All Samples Combined			407	335	0	742	100.0	287	88.5	737	268
Sex Composition (%)			54.9	45.1							24.9
Not Aged			58	47	0	105	14.2	295	88.4	105	270
Sex Composition (%)			55.2	44.8							24.2
											105

Appendix B.25. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches,
Unalakleet Subdistrict, Norton Sound District, 1991.

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
20 - 26 May	2											
	3											
	4											
	5	1	0	0	1	0.9	254		1	263		1
	6	0	1	0	1	0.9	314		1	255		1
	7	12	7	0	19	16.2	286	39.3	19	266	7.7	19
	8	15	2	0	17	14.5	314	51.1	17	272	11.0	17
	9	9	10	0	19	16.2	360	29.2	19	282	7.0	19
	10	12	10	0	22	18.8	383	38.7	22	303	35.5	22
	11	9	8	0	17	14.5	394	45.8	17	292	8.2	17
	12	7	7	0	14	12.0	395	57.1	14	295	10.5	14
	13	1	4	0	5	4.3	425	32.7	5	294	4.9	5
	14	1	1	0	2	1.7	368	36.1	2	295	0.0	2
	15											
	16											
	17											
Sample Total		67	50	0	117	100.0	357	60.2	117	285	21.6	117
27 May - 2 June	2											
	3											
	4											
	5	6	5	0	11	5.2	197	36.2	11	240	10.2	11
	6	6	1	0	7	3.3	222	31.3	7	245	6.6	7
	7	21	16	0	37	17.6	274	41.1	37	266	19.9	37
	8	16	8	0	24	11.4	310	51.1	24	277	21.9	24
	9	36	15	0	51	24.3	352	44.0	51	280	9.4	51
	10	25	17	0	42	20.0	364	54.2	42	282	11.6	42
	11	11	10	0	21	10.0	398	58.1	21	295	22.8	21
	12	8	3	0	11	5.2	394	34.2	11	292	9.9	11
	13	5	1	0	6	2.9	434	57.8	6	296	8.3	6
	14											
	15											
	16											
	17											
Sample Total		134	76	0	210	100.0	332	73.6	210	277	20.4	210
3 - 9 June	2											
	3	1	1	0	2	0.8	95	0.0	2	198	3.5	2
	4	9	5	0	14	5.7	126	17.9	14	212	9.8	14
	5	20	18	0	38	15.4	176	39.7	38	234	12.7	38
	6	3	4	0	7	2.8	208	24.0	7	243	6.8	7
	7	17	6	0	23	9.3	263	46.0	23	265	11.6	23
	8	12	20	0	32	13.0	297	40.3	32	278	24.4	32
	9	52	28	0	80	32.4	325	45.8	80	282	22.4	80
	10	14	16	0	30	12.1	342	45.4	30	292	27.0	30
	11	6	6	0	12	4.9	356	41.7	12	288	10.9	12
	12	5	2	0	7	2.8	358	44.3	7	288	12.4	7
	13	1	0	0	1	0.4	445		1	315		1
	14	1	0	0	1	0.4	366		1	300		1
	15											
	16											
	17											
Sample Total		141	106	0	247	100.0	281	83.3	247	269	31.4	247

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Appendix B.25. (p. 2 of 2)

Sample Week	Age	Sex (number)			Percent of Total	Weight		Length				
		Male	Female	Unknown		Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3	1	1	0	2	0.3	95	0.0	2	198	3.5	2
	4	9	5	0	14	2.4	126	17.9	14	212	9.8	14
	5	27	23	0	50	8.7	182	40.5	50	236	12.9	50
	6	9	6	0	15	2.6	222	37.1	15	245	7.0	15
	7	50	29	0	79	13.8	274	42.5	79	265	15.3	79
All Weeks Combined	8	43	30	0	73	12.7	305	46.6	73	276	21.0	73
20 May - 9 June	9	97	53	0	150	26.1	338	45.7	150	281	17.4	150
	10	51	43	0	94	16.4	361	50.1	94	290	25.3	94
	11	26	24	0	50	8.7	387	52.6	50	292	16.3	50
	12	20	12	0	32	5.6	387	48.6	32	292	10.7	32
	13	7	5	0	12	2.1	432	44.1	12	297	8.6	12
	14	2	1	0	3	0.5	367	25.5	3	297	2.9	3
	15											
	16											
	17											
ALL Samples Combined		342	232	0	574	100.0	315	81.5	574	275	26.7	574
Sex Composition (%)		59.6	40.4									
Not Aged		32	24	1	57	9.9	289	83.7	57	266	23.8	57
Sex Composition (%)		57.1	42.9									

Appendix B.26. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches, Cape Denbigh subdistrict, Norton Sound District, 1991.

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
20 - 26 May	2										
	3	1	0	0	1	0.2	72	1	182		1
	4	1	0	0	1	0.2	150	1	220		1
	5	10	5	0	15	3.6	181	28.4	15	236	8.8
	6	3	1	0	4	1.0	215	34.1	4	250	9.9
	7	22	17	0	39	9.4	268	41.5	39	266	9.2
	8	30	33	0	63	15.1	298	37.1	63	272	7.5
	9	57	46	0	103	24.8	344	36.1	103	280	6.9
	10	47	33	0	80	19.2	372	45.7	80	288	7.9
	11	29	22	0	51	12.3	390	44.7	51	293	8.3
	12	19	18	0	37	8.9	408	49.2	37	299	9.8
	13	6	13	0	19	4.6	406	43.8	19	295	7.4
	14	1	2	0	3	0.7	413	68.2	3	300	22.6
	15										
	16										
	17										
Sample Total		226	190	0	416	100.0	342	70.0	416	281	16.9
27 May - 2 June	2										
	3										
	4	9	2	0	11	2.6	135	20.1	11	220	11.3
	5	22	21	0	43	10.3	175	26.3	43	234	7.8
	6	11	6	0	17	4.1	212	29.2	17	246	8.5
	7	38	29	0	67	16.0	259	43.7	67	263	10.1
	8	28	17	0	45	10.7	311	38.6	45	272	8.5
	9	63	60	0	123	29.4	335	36.1	123	278	7.3
	10	30	15	0	45	10.7	362	38.6	45	286	8.9
	11	25	6	0	31	7.4	373	36.4	31	289	7.1
	12	18	10	0	28	6.7	394	50.4	28	294	9.8
	13	2	4	0	6	1.4	396	36.9	6	295	5.7
	14	1	2	0	3	0.7	439	35.9	3	297	9.5
	15										
	16										
	17										
Sample Total		247	172	0	419	100.0	305	79.4	419	271	20.7
3 - 9 June	2										
	3	5	6	0	11	2.6	93	14.1	11	201	4.9
	4	8	6	0	14	3.4	119	20.3	14	218	10.1
	5	34	40	0	74	17.7	160	28.0	74	232	7.5
	6	7	9	0	16	3.8	185	39.1	16	240	8.6
	7	20	19	0	39	9.4	232	39.3	39	264	9.2
	8	33	21	0	54	12.9	267	33.6	54	272	9.4
	9	60	60	0	120	28.8	295	42.8	120	276	8.1
	10	17	22	0	40	9.6	314	47.3	40	284	10.4
	11	13	7	0	20	4.8	307	51.3	20	285	9.6
	12	15	9	0	24	5.8	327	38.2	24	292	9.3
	13	2	2	0	4	1.0	367	27.3	4	299	13.1
	14	1	0	0	1	0.2	342		1	301	1
	15										
	16										
	17										
Sample Total		215	201	0	417	100.0	251	77.3	417	264	24.9

-Continued-

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
10 - 16 June	2											
	3	23	6	0	29	11.8	79	10.7	29	189	7.2	29
	4	8	10	0	18	7.3	115	12.6	18	212	7.6	18
	5	35	33	0	68	27.8	156	22.7	68	231	8.8	68
	6	3	5	0	8	3.3	170	34.6	8	238	8.5	8
	7	5	6	0	11	4.5	222	38.7	11	256	13.5	11
	8	13	9	0	22	9.0	271	38.6	22	269	8.9	22
	9	22	25	0	47	19.2	290	34.0	47	274	9.7	47
	10	3	10	0	13	5.3	328	29.2	13	287	7.2	13
	11	5	11	0	16	6.5	332	32.6	16	293	7.0	16
	12	5	5	0	10	4.1	347	35.9	10	294	4.9	10
	13	0	3	0	3	1.2	363	23.4	3	298	4.6	3
	14											
	15											
	16											
	17											
Sample Total		122	123	0	245	100.0	215	93.1	245	248	34.2	245
All Weeks Combined	2											
	3	29	12	0	41	2.7	83	13.0	41	192	8.4	41
	4	26	18	0	44	2.9	122	19.1	44	216	9.9	44
	5	101	99	0	200	13.4	164	27.2	200	233	8.2	200
	6	24	21	0	45	3.0	195	37.3	45	243	9.2	45
	7	85	71	0	156	10.4	252	44.4	156	264	10.2	156
	8	104	80	0	184	12.3	289	40.7	184	272	8.5	184
	9	202	191	0	393	26.3	320	44.2	393	278	8.0	393
	10	97	80	0	178	11.9	353	49.2	178	287	8.8	178
	11	72	46	0	118	7.9	364	52.6	118	291	8.6	118
	12	57	42	0	99	6.6	378	56.4	99	295	9.7	99
	13	10	22	0	32	2.1	395	41.3	32	296	7.6	32
	14	3	4	0	7	0.5	414	56.1	7	299	14.3	7
	15											
	16											
	17											
All Samples Combined		810	686	0	1497	100.0	285	91.3	1497	268	26.1	1497
Sex Composition (%)		54.1	45.9									
Not Aged		8	6	0	14	0.9	309	88.9	14	274	19.1	14
Sex Composition (%)		57.1	42.9									

Appendix B.27. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches, Norton Bay\Elim Subdistricts combined, Norton Sound District, 1991.

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4	2	2	0	4	1.4	0		0	226	5.1	4
	5	26	33	0	59	21.2	177	22.6	21	234	8.1	59
	6	11	7	0	18	6.5	202	49.9	10	244	10.4	18
	7	11	9	0	20	7.2	251	52.8	10	262	12.2	20
	8	43	17	0	60	21.6	285	27.9	15	267	7.5	60
3 - 9 June	9	57	24	0	81	29.1	311	41.6	42	274	9.4	81
	10	8	8	0	16	5.8	326	31.9	10	279	5.3	16
	11	7	1	0	8	2.9	352	25.1	6	284	8.4	8
	12	6	0	0	6	2.2	368	27.9	4	293	3.0	6
	13	3	1	0	4	1.4	454	118.8	2	301	14.4	4
	14	1	1	0	2	0.7	300		1	289	10.6	2
	15											
	16											
	17											
All Samples Combined		175	103	0	278	100.0	278	73.2	121	262	20.2	278
Sex Composition (%)		62.9	37.1									
Not Aged		1	1	0	2	0.7	0		0	253	12.0	2
Sex Composition (%)		50.0	50.0									

Appendix B.28. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catches,
Norton Sound District combined, 1991.

Sample Week	Age	Sex (number)				Percent of Total	Weight		Length			
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
20 - 26 May	2											
	3	1	0	0	1	0.2	72		1	182		1
	4	1	0	0	1	0.2	150		1	220		1
	5	11	6	0	17	2.6	186	31.9	17	237	10.6	17
	6	4	3	0	7	1.1	261	63.4	7	255	10.3	7
	7	39	33	0	72	11.0	271	41.2	72	266	8.5	72
	8	49	41	0	90	13.7	302	39.6	90	273	8.2	90
	9	86	71	0	157	24.0	344	36.5	157	280	7.6	157
	10	81	55	0	136	20.8	367	45.7	136	290	16.8	136
	11	47	36	0	83	12.7	388	43.0	83	293	8.4	83
	12	32	27	0	59	9.0	396	53.5	59	297	10.3	59
	13	7	19	0	26	4.0	410	41.4	26	295	6.9	26
	14	2	3	0	5	0.8	395	57.3	5	298	16.2	5
	15											
	16											
	17	1	0	0	1	0.2	324		1	288		1
Sample Total		361	294	0	655	100.0	343	65.7	655	282	17.1	655
27 May - 2 June	2											
	3											
	4	9	2	0	11	1.3	135	20.1	11	220	11.3	11
	5	31	28	0	59	7.0	180	28.9	59	235	8.6	59
	6	22	9	0	31	3.7	214	27.0	31	246	7.5	31
	7	73	59	0	132	15.8	265	42.1	131	264	13.5	132
	8	61	37	0	98	11.7	314	42.6	97	274	12.8	98
	9	137	100	0	237	28.3	343	40.5	234	279	8.4	237
	10	80	48	0	128	15.3	362	44.0	128	285	9.7	128
	11	42	26	0	68	8.1	386	46.1	68	292	14.0	68
	12	38	18	0	56	6.7	391	44.5	56	294	10.4	56
	13	8	6	0	14	1.7	406	52.0	14	295	6.7	14
	14	1	2	0	3	0.4	439	35.9	3	297	9.5	3
	15											
	16											
	17											
Sample Total		502	335	0	837	100.0	319	75.5	832	274	19.7	837
3 - 9 June	2											
	3	8	10	0	18	1.4	95	12.8	18	200	5.5	18
	4	38	23	0	61	4.7	122	17.5	57	216	8.9	61
	5	111	135	0	246	18.9	164	29.3	208	233	8.9	246
	6	33	26	0	59	4.5	191	35.6	51	242	9.4	59
	7	69	49	0	118	9.0	250	43.3	108	263	10.2	118
	8	114	69	0	183	14.0	283	36.3	138	271	13.0	183
	9	210	150	0	360	27.6	311	44.0	321	278	13.1	360
	10	70	66	0	137	10.5	329	46.2	131	286	15.4	137
	11	36	22	0	58	4.4	338	48.6	56	287	9.9	58
	12	32	17	0	49	3.8	344	41.9	47	292	8.8	49
	13	7	4	0	11	0.8	400	64.6	9	301	12.0	11
	14	3	1	0	4	0.3	336	33.4	3	295	9.3	4
	15											
	16											
	17											
Sample Total		731	572	0	1304	100.0	263	83.0	1147	264	26.1	1304

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Appendix B.28. (p. 2 of 2)

Sample Week	Age	Sex (number)			Percent of Total	Weight			Length		
		Male	Female	Unknown		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2										
	3	23	6	0	29	9.8	79	10.7	29	189	7.2
	4	10	14	0	24	8.1	116	11.9	24	212	7.4
	5	44	44	0	88	29.8	154	22.6	88	230	9.6
	6	6	8	0	14	4.7	175	31.5	14	241	11.2
	7	6	13	0	19	6.4	220	38.9	19	257	15.8
	8	14	13	0	27	9.2	271	34.8	27	269	8.2
10 - 16 June	9	23	26	0	49	16.6	290	33.7	49	274	9.6
	10	3	11	0	14	4.7	329	28.1	14	287	6.9
	11	6	12	0	18	6.1	334	33.1	18	293	7.0
	12	5	5	0	10	3.4	347	35.9	10	294	4.9
	13	0	3	0	3	1.0	363	23.4	3	298	4.6
	14										
	15										
	16										
	17										
Sample Total		140	155	0	295	100.0	210	89.7	295	247	33.1
All Weeks Combined											295
20 May - 16 June	8	238	160	0	398	12.9	295	41.3	352	272	11.8
	9	456	347	0	803	26.0	326	44.8	761	278	10.8
	10	234	180	0	415	13.4	352	47.9	409	287	14.3
	11	131	96	0	227	7.3	371	50.4	225	291	10.8
	12	107	67	0	174	5.6	377	51.8	172	294	9.8
	13	22	32	0	54	1.7	404	48.2	52	296	8.2
	14	6	6	0	12	0.4	391	58.2	11	297	11.7
	15										
	16										
	17	1	0	0	1	0.0	324		1	288	1
All Samples Combined		1734	1356	0	3091	100.0	291	88.8	2929	269	25.7
Sex Composition (%)		56.1	43.9								3091
Not Aged		99	78	1	178	5.8	294	86.6	176	269	23.7
Sex Composition (%)		55.9	44.1								178

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